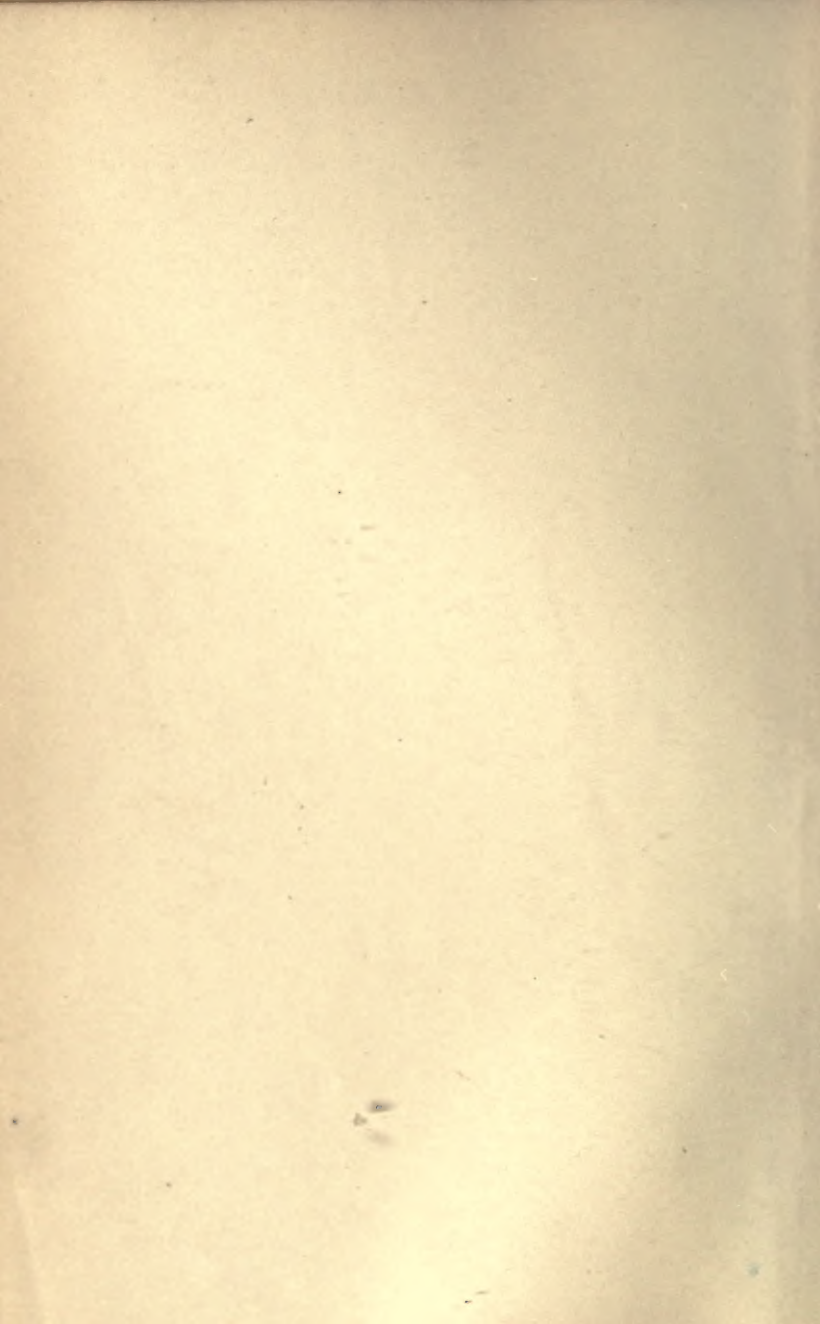




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MILITARY ORGANIZATION AND
ADMINISTRATION



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MILITARY ORGANIZATION AND ADMINISTRATION

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INTRODUCTION

HAVING been incapacitated from general service in the field, the author of these lectures was appointed an Instructor to the Canadian Military School, in which capacity he had the proud privilege of giving lectures to several thousands of Officers of the Canadian Forces, to whom he takes this opportunity of expressing his earnest appreciation of the never-failing courteous attention which was exhibited by the classes throughout the period of their instruction. The evident desire for knowledge of their technical duties which the classes displayed was an encouragement to the Staff, and gave them the great pleasure of feeling that their efforts were not given in vain.

Owing to the many requests that have been made to the writer from time to time for copies of the lectures which had previously been given to the classes, the author has been emboldened to offer them in book form, in the hope that they may be instructive and useful to the many Officers of our new armies who have not the time or need for delving into the many authorities which it is necessary to consult to get a complete knowledge of the intricate but systematic operations of the administrative work connected with the employment of the forces in the field.

It is a subject of much discussion whether it is necessary for an Officer to know so much about the working of the other arms and services, and no apology is offered by the

author for broaching such a wide range within the scope of his lectures. It will be sufficient, to express the opinion of the author, to quote from some of the British military classics wherein the views of much more able soldiers than the author claims to be have clearly and briefly summed up the situation as follows:

“ . . . The wider our understanding is of the relation of local problems to the whole, the more successful may we expect to be in solving them.

“ Modern war calls for an intelligent use of initiative by subordinates, and it is certain that the subordinate who grasps the broad situation most clearly will solve the local situation most intelligently ” (Hamley’s “ Operations of War ”).

“ The full power of an army can be exerted only when all its parts act in close combination, and this is not possible unless the members of each arm understand the characteristics of the other arms ” (Field Service Regulations, Part I., Sec. 2).

The progress made in scientific warfare daily increases the number and class of weapons which are used by each side, and as the improvement of close-range weapons increases the number of parts which are actually represented in the firing-line, and as the supply of the necessary munitions for their continued employment involves a constant chain of communication over territory used by all ranks and arms, the contact between the various arms becomes more and more intimate, for which reason it is essential that every Officer should be acquainted with the organization and employment of the other units with whom he is in contact, otherwise he cannot ask for, and perhaps direct, in any intelligent way, the co-operation which is so necessary to achieve success.

In presenting the subject to the classes, the aim of the

author was to get interest, and to hold that interest. In a subject such as that which this book discusses, the danger of employing a mass of non-essential figures must be avoided if the interest is to be maintained, and since very few of those which may be important to an Officer undergoing examination for a permanent commission in a corps in time of peace are really necessary for the Officer of another arm, who desires only a working knowledge of the army as a whole, the figures have not been quoted. The lectures have been prepared with the object of showing that every arrangement is made *before* the forces take the field, and that the preparation of systems of maintenance, record, etc., are not left to the individual Commanders, whereby a series of disjointed links of different sizes and qualities are forged, but instead we have a uniform system throughout the service, the links being a part of a huge chain, wherein every link has been fitted to the whole, and by the test of centuries of experience proved to be sound.

A word of warning may be offered to all Officers—and should this book interest civilians, to them also—in regard to the all too prevalent tendency to make a fetish of the German organization, with a more than corresponding depreciation of our own system. Experience has shown that our own textbooks have been founded upon sound principles, and that they have fully justified the training which our troops have been given both prior and subsequent to the declaration of war. This point cannot be too strongly impressed upon every Officer and other rank, and if instead of a wild search for so-called “trench instruction” closer attention is paid to the official textbooks, the soldier will go into the field fully equipped mentally to deal with every situation with which he comes into contact. The list of books consulted in the preparation of these lectures is given in the introductory pages of this book, and it is upon

these official authorities alone, and upon no theories of the author, that these lectures have been prepared. The principles therein laid down are the same as those taught to the original Expeditionary Force, and they are as sound to-day as they were at the time when that force achieved its everlasting glory in the application of their peace training.

If any Officer or other rank masters the details laid down in these lectures, he will be able to observe the actual working in the field from what he sees going on around him. The same routine as is described is carried on in the front to-day, the only changes being described in the last chapter of this book. As we hope to take part in the great advance when Germany, under the pressure of the Allied weight begins her great retreat, we shall see the original lectures of the book carried into practice, without confusion or loss of efficiency, as a result of the careful preparation which attended the construction of the administrative chain of the Army.

In conclusion, the author offers this book to the public, not as any original production from his own brains, but the condensed technical detail contained in many military works, compiled and reproduced into convenient form under one cover. In submitting the lectures in book form, it is the desire of the author to help our New Armies in obtaining a clear working knowledge of the various parts with which they are connected by the force of need, but of whose working they see but little, other than the tangible products which reach their hands. By understanding these conditions clearly, it will frequently work to the mutual advantage of both parties, in so far as local difficulties can be bridged by the co-operation which knowledge of each other makes possible.

G. R. N. C.

BEXHILL,
September 1, 1917.

TABLE OF CONTENTS

CHAPTER I

ORGANIZATION OF THE ARMY FOR WAR

	PAGES
Organization of the Army—Units—Fighting Troops—Administrative Troops—War Establishments—War Equipment—Standardization—Tactical Organization—Formations—Table of Organization	1-29

CHAPTER II

COMMAND IN THE FIELD

The Chief Command—Decentralization—Unity of Effort—Subordinate Control—Division of Labour—Lines of Communication Executive—Lines of Communication Defence—Lines of Communication Control and Administration—Military and Naval Co-operation	30-46
---	-------

CHAPTER III

THE STAFF AND THEIR DUTIES

The Staff—Division of Duties—The Chief Staff Officer—Branches—Sections—Subsections—Co-ordination of the Staff Divisions—Interdependence of the Parts—Special and Personal Appointments—Grade and Seniority	47-65
--	-------

CHAPTER IV

THE DISTRIBUTION OF STAFF

Attached Officers—Substaff—Artillery Headquarters—Engineer Headquarters—Administrative Representatives—Relation of—Distribution of the Administrative Representatives to Branches	66-77
---	-------

CHAPTER V

ADMINISTRATIVE SERVICES AND DEPARTMENTS

PAGES

Representatives on Staff, Responsibility of—Relations to Staff and Heads of Services	78-84
---	-------

CHAPTER VI

STRATEGICAL CONCENTRATION

Preparations in Time of Peace—Mobilization—Strategic Advance— The Landing of the Army—Consolidation of Landing—Prepara- tions for Arrival of Main Body—Advance-Party	85-93
--	-------

CHAPTER VII

LINES OF COMMUNICATION

Advance of Main Body—Building up—Home Bases—Overseas Bases—Advanced Bases—Regulating Stations—Railhead— Rendezvous—Refilling Points—Connection with the Field Forces—Operation of Lines of Communication	94-106
---	--------

CHAPTER VIII

MOVEMENT OF TROOPS AND STORES BY SEA

Co-operation of Royal Navy—Embarkation Staff—Classification of Vessels—Inspection of Embarkations—Duties during Voyage —Military Landing Officer—Disembarkations—Loading and Unloading	107-120
---	---------

CHAPTER IX

MOVEMENT OF TROOPS AND STORES BY RAIL

Railway Transport Service—Operation of Railways—Railway Transport Officers—Allotment of Regular Tonnage—Special Tonnage—Entraining—Responsibility whilst travelling— Detraining—Loading and Unloading	121-134
--	---------

CHAPTER X

ROAD TRANSPORT

	PAGES
Classes of—Types of Vehicles—Harness—Loads—Care of Animals	
— Mechanical Transport—System of Working—Indents—	
Traffic Control—Inland Water Transport	135-150

CHAPTER XI

QUARTERS

Quarters—Classes of—Distribution in—Billets—Duties when arranging—Precautions—Water Supply—Bivouacs—Space required—Camps—General Duties in Quarters—Employment of Troops	151-168
---	---------

CHAPTER XII

UTILIZING THE RESOURCES OF A COUNTRY

Peace Preparations—Strategic and Tactical Advantages—Requisi- tions—Method of making—Contributions—Purchases	169-186
---	---------

CHAPTER XIII

FEEDING AN ARMY IN THE FIELD

Food Supplies—Scale of Rations—How obtained—Forage—Pre- parations—Subsistence during Sea Voyage—Subsistence during Strategical Advance—Concentration of Supplies—Distribution and Issue—Scale of Equivalents—Indents—Captured Sup- plies	187-215
--	---------

CHAPTER XIV

ORDNANCE SERVICES IN WAR

Ordnance Services—Clothing and Equipment—Field Scale of— Base Reserve—Replenishment—Distribution and Issue—Ord- nance Workshops	216-227
---	---------

CHAPTER XV

AMMUNITION SUPPLY

PAGES

System of Packing—Capacity of Vehicles—Duties of Reserve Commanders—Ammunition Parks—Ammunition Columns—Quantities carried with Field Units	228-241
---	---------

CHAPTER XVI

PERSONNEL AND REINFORCEMENTS

Peace Reserves—War Establishments—Mobilization—System of Concentrating—First Reinforcements—Subsequent Reinforcements—Reporting Casualties—Demands from Base—Base Depots—System of forwarding—Employment of Civilians—Grading and Pay—Records of—Identification	242-255
---	---------

CHAPTER XVII

MEDICAL SERVICES IN THE FIELD

Preservation of Health—Duty of Medical Officers—Sanitation and Hygiene—Effect of Age and Service on Health—Statistics of Previous Campaigns—Sanitary Organization on Lines of Communication—In the Field—Responsibilities of Officers and N.C.O.—Prevention better than Cure—Precautionary Steps	256-271
--	---------

CHAPTER XVIII

EVACUATION OF THE SICK AND WOUNDED

Organization of Medical Units—System of Evacuation—Treatment—Invaliding—Red Cross Protection—Voluntary Organization	272-286
---	---------

CHAPTER XIX

REMOUNT AND VETERINARY SERVICES

Provision of Animals—Classification—Registration—Purchase—Subsidization—Mobilization—Reinforcements—Shipment—Care of Sick Animals—Veterinary Hospitals—Convalescent Depots—Captured Animals	287-296
---	---------

CHAPTER XX

THE PAY DEPARTMENT

	PAGES
Responsibility for Public Moneys—Payment of Accounts—Purchases —Payment for Requisitions—Field Paymasters—Payment of Troops—Imprest-Holders—Rates of Pay—Allowances— Records of Awards affecting Pay—Remittances—Assign- ments	297-313

CHAPTER XXI

STATES, RECORDS, AND RETURNS

Records on Mobilization—Records of Embarkation—Base Records —Field Records—Collective States and Returns—Individual Records—Despatches—Reports on Actions—War Diaries— Historical Records	314-332
--	---------

CHAPTER XXII

CORRESPONDENCE AND POSTAL SERVICE

Rules regarding Field Correspondence—Formal Correspondence— Memoranda—Field Messages—Chain of Communication— Secret and Confidential Document—Method of Despatch— Censorship—Postal Organization—Collection and Distribution —Sale of Money Orders, Stamps, etc.	333-351
--	---------

CHAPTER XXIII

INTERCOMMUNICATION IN THE FIELD

The Signal Service—Lines of Communication—Organizations— Organization of Field Unit—Method of writing Messages—Rules to be observed—Rules regarding Use of Wireless—Method of Despatch—Despatch Rider Letter Service—Responsibility of Commanders for Communications	352-368
--	---------

CHAPTER XXIV

ENGINEER SERVICES

Lines of Communication—Organization—Responsibility on Lines of Communication—In the Field—Engineers in Relation to other Arms—Bridging—Mining—Field Fortifications—Distri- bution of Tools and Material—Explosives	369-387
---	---------

CHAPTER XXV

MILITARY GOVERNMENT AND DISCIPLINE

	PAGES
Laws governing the Troops—Arrest and Trial of Offenders—Courts Martial—Provost Marshals—Military Police—Control of Civilians—Precautionary Measures—Prisoners of War—Enemy Intercourse with our own Forces	388-400

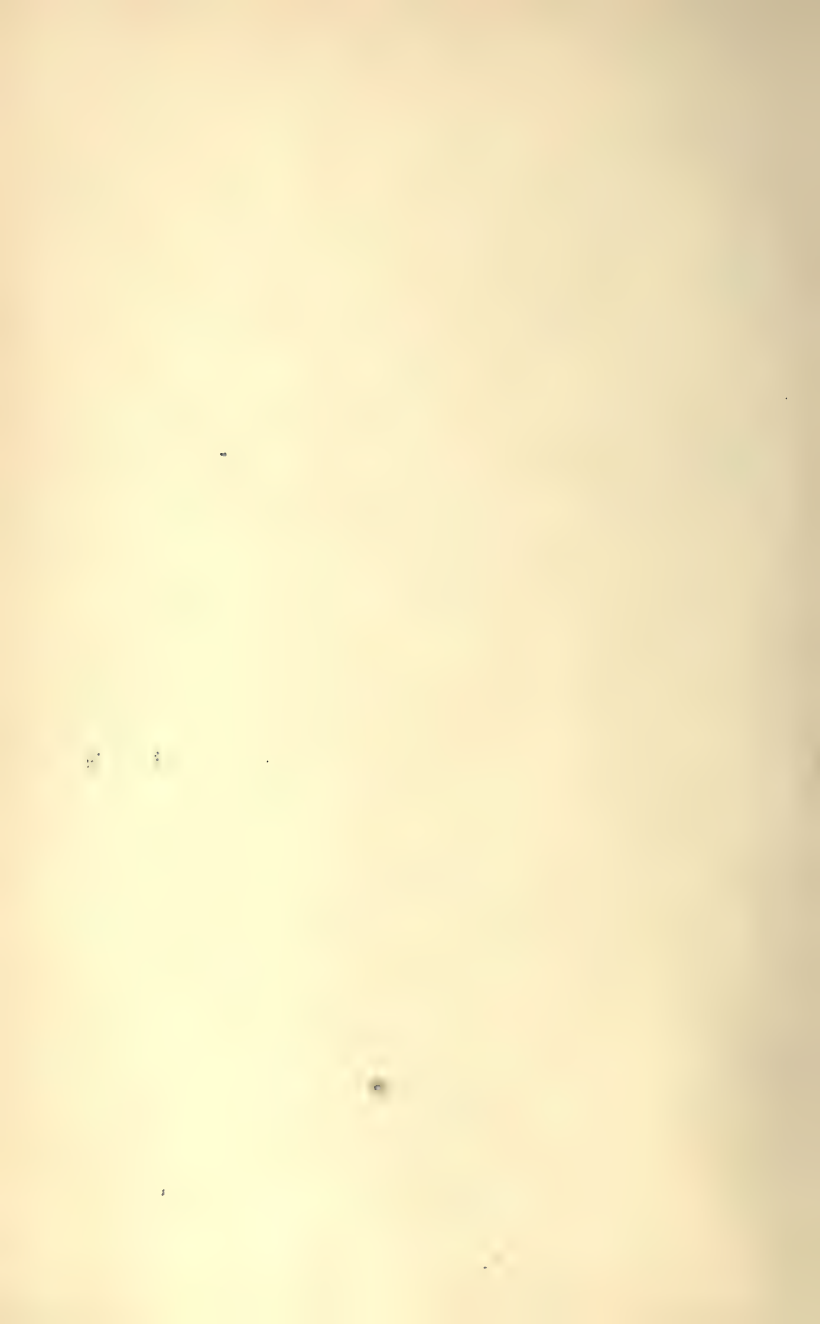
CHAPTER XXVI

RECAPITULATION

Relation of Mobile System to Siege or "Trench" Warfare—Comparison of Administrative System under Mobile and "Trench" Conditions—Review of Previous Lectures—Co-ordination of all Services by Staff—Interdependence of Field Forces on the Line of Communications—Facts for Future Study—Value of Knowledge of General Working of the Whole Army	401-414
---	---------

LIST OF PLATES

PLATE	PAGE
I. TACTICAL COMPOSITION OF AN INFANTRY DIVISION - <i>facing</i>	25
II. THE CHAIN OF COMMAND IN THE FIELD - - -	38
III. CHAIN OF RESPONSIBILITY ON LINES OF COMMUNICATION -	46
IV. CHART SHOWING DISTRIBUTION AND CHAIN OF RESPONSIBILITY IN A FIELD STAFF - - - -	73
V. LINES OF COMMUNICATION - - - - <i>facing</i>	96
VI. LINES OF COMMUNICATION - - - - "	102
VII. DIRECTION AND CONTROL MOVEMENTS BY SEA - -	120
VIII. CHAIN OF RESPONSIBILITY FOR RAILWAY TRANSPORT -	134
IX. TYPES OF ARMY VEHICLES - - - - <i>facing</i>	138
X. SUPPLY SYSTEMS - - - - "	206
XI. DISTRIBUTION OF SUPPLIES - - - - "	210
XII. AMMUNITION SUPPLY: INFANTRY DIVISION - - - "	238
XIII. EVACUATION OF WOUNDED - - - - "	280
XIV. SIGNAL SERVICES - - - - "	358



OFFICIAL TEXTBOOKS USED IN COMPILING LECTURES

- Army Orders.
- Army Pay, Appointment, Promotion, etc. (Royal Warrant), 1914.
- Army Service Corps Training, Parts I., II., III., IV., and amendments.
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- Barracks, Care of, 1901.
- Cavalry Training, reprint 1914.
- Conveyance of Troops and Issue of Travelling Warrants.
- Cooking, Military Manual of.
- Cyclist Training, 1914.
- Engineer Training, reprint 1914.
- Engineering, Military, Parts I., II., IIIA., IIIB., IV., V., VI.
- Equipment Regulations, reprint 1914.
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- Law, Military Manual of, 1912, and amendments.
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- Mobilization Regulations, 1914.
- Ordnance Manual, War, 1914.
- Pay Duties, of Officers commanding Companies, etc., 1914.
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- Railway Manual, War.
- Remount Manual, War, 1913.
- Remount Regulations, 1913.
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Signal Service, Army Manual of, War, 1914.

Supply Manual, War, 1909.

Supply, Reorganized System of, 1912.

Training and Manœuvre Regulations, 1913.

Transport Manual, Field Service, 1905.

Transport, Mechanical.

Transport, Pack, Notes on.

Veterinary Services, Army Regulations, 1906.

Water Supply Manual.

Works Manual, War, 1913.

Yeomanry and Mounted Rifle Training.

OFFICIAL ABBREVIATIONS

“ A ”	..	..	Adjutant-General's Branch.
A.A.	..	..	Army Act.
A.B.	..	..	Army Book.
A.F.	..	..	Army Form.
A.D.C.	..	..	Aide-de-Camp.
Admn.	..	..	Administration.
A.D. Sigs.	..	..	Assistant Director of Signals.
Adv. Gd.	..	..	Advanced Guard.
Amm.	..	..	Ammunition.
A.G.	..	..	Adjutant-General.
A.D.M.S.	..	..	Assistant Director of Medical Services.
A.O.	..	..	Army Order.
A.P.M.	..	..	Assistant Provost-Marshal.
Art.	..	..	Artillery.
Batt.	..	..	Battery.
B.C.	..	..	Battery Commander.
Bde.	..	..	Brigade.
B.M.	..	..	Brigade-Major.
Bn.	..	..	Battalion.
Br. ..	..	..	Bugler or Bombardier.
Brig.-Gen.	..	..	Brigadier-General.
Capt.	..	..	Captain.
Cav.	..	..	Cavalry.
C.B.	..	..	Confinement to barracks.
C.G.S.	..	..	Chief of General Staff in the Field.
Col. ..	..	..	Colonel.
Coln.	..	..	Column.
Commdt.	..	..	Commandant.
Commdr.	..	..	Commander.
C.-in-C.	..	..	Commander-in-Chief
Commng.	..	..	Commanding.

Official Abbreviations

C.O ..	..	..	Commanding Officer.
Co. ..	..	..	Company.
Cpl. ..	..	..	Corporal.
D.A.G. ..	..	..	Deputy Adjutant-General.
D.D.M.S. ..	..	..	Deputy Director of Medical Services.
D.J.A.G. ..	..	..	Deputy Judge-Advocate-General.
Det. ..	..	..	Detachment.
Dept. ..	..	..	Department.
Dist. ..	..	..	District.
Div. ..	..	..	Division.
Dn. ..	..	..	Dragoon.
D.G. ..	..	..	Dragoon Guard.
Dr. ..	..	..	Drummer or Driver.
D. Sigs. ..	..	..	Director of Army Signals.
D.M.S. ..	..	..	Director of Medical Services.
D.O.S. ..	..	..	Director of Ordnance Services.
D. Post. ..	..	..	Director of Postal Services.
D.R.T. ..	..	..	Director of Railway Transport.
D. Remounts ..	..	..	Director of Remounts.
D.S. ..	..	..	Director of Supplies.
D.S.T. ..	..	..	Director of Sea Transport.
D.T. ..	..	..	Director of Transport.
D.V.S. ..	..	..	Director of Veterinary Services.
D.W. ..	..	..	Director of Works.
Est. ..	..	..	Establishment.
F. Amb. ..	..	..	Field Ambulance.
F. Co. ..	..	..	Field Company of Engineers.
F.G.C.M. ..	..	..	Field General Court Martial.
F. Imp. ..	..	..	Field Imprisonment.
F.S.M. ..	..	..	Field Service Manual.
F.P. ..	..	..	Field Punishment.
F.S.R. ..	..	..	Field Service Regulations.
G.C.M. ..	..	..	General Court Martial.
G.H.Q. ..	..	..	General Headquarters.
G.O.C. ..	..	..	General Officer Commanding.
Gr. ..	..	..	Gunner.
G.S. _t ..	..	..	General Service or General Staff.
" G " ..	..	..	General Staff Branch.
H.Q. ..	..	..	Headquarters.
H.E. ..	..	..	High explosive, or Horizontal equivalent.
Howr. ..	..	..	Howitzer.
Hosp. ..	..	..	Hospital.

Hr. ..	..	.. Hussar.
i/c ..	..	.. In charge of.
I.G.C.	..	.. Inspector-General of Communications.
Inf.	..	.. Infantry.
J.A.G.	..	.. Judge-Advocate-General.
Lieut.	..	.. Lieutenant.
Lt.-Gen.	..	.. Lieutenant-General.
L. of C.	..	.. Lines of Communication.
Lr. ..	..	.. Lancer.
M.G.	..	.. Machine Gun.
Maj.-Gen.	..	.. Major-General.
Med.	..	.. Medical.
M.F.P.	..	.. Military Foot Police.
M.L.O.	..	.. Military Landing Officer.
M.P.	..	.. Military Police.
M.M.P.	..	.. Military Mounted Police.
M.F.E.	..	.. Manual of Field Engineering.
M.O.	..	.. Medical Officer.
Mtd.	..	.. Mounted.
M.T.	..	.. Mechanical Transport.
M.V.	..	.. Muzzle velocity.
M.P.H.	..	.. Miles per hour.
N.C.O.	..	.. Non-Commissioned Officer.
O.C.	..	.. Officer Commanding.
Offr.	..	.. Officer.
Ord.	..	.. Ordnance.
O.R.S.	..	.. Orderly Room Sergeant.
P.C.	..	.. Principal Chaplain.
Pt. ..	..	.. Platoon.
P.M.	..	.. Provost-Marshal.
Pmr.	..	.. Paymaster.
P.O.	..	.. Post Office.
Pte.	..	.. Private.
P.W.	..	.. Royal Pay Warrant.
" Q "	..	.. Quartermaster-General's Branch.
Q.F.	..	.. Quickfiring.
Q.M.	..	.. Quartermaster.
Q.M.G.	..	.. Quartermaster-General.
Q.M.S.	..	.. Quartermaster-Sergeant.
R.C.M.	..	.. Regimental Court Martial
R.F.	..	.. Representative fraction.
R.T.O.	..	.. Railway Transport Officer.

Rgt.	..	..	Regiment.
S.A.A.	..	..	Small arm ammunition.
Sec.	..	..	Section.
Sgt.	..	..	Sergeant.
S.M.	..	..	Sergeant-Major.
S.O.	..	..	Staff Officer.
Sqn.	..	..	Squadron.
S.O.	..	..	Supply Officer.
S.S.O.	..	..	Senior Supply Officer.
Tel.	..	..	Telegraph.
T.O.	..	..	Transport Officer.
T. and S.	..	..	Transport and Supply.
Tp.	..	..	Troop.
Tpr.	..	..	Trooper.
Vet.	..	..	Veterinary.
V.I.	..	..	Vertical interval.
W.E.	..	..	War establishments.

Note.—A combination of any of the above will give the necessary abbreviation for addressing correspondence. As an illustration, suppose the writer desired to address by signal telegraph a cavalry regiment in a certain division, the following would be the address:

and if required: “—Cav. Rgt.”
 “—Cav. Bde.,”
 “—Cav. Div.”

In referring to the various grades of administrative staff and service appointments, the following are the usual prefixes:

D.	..	..	Director.
D.D.	..	..	Deputy Director.
A.D.	..	..	Assistant Director.
D.A.D.	..	..	Deputy Assistant Director.

The same prefixes apply to the staff of the “A” and “Q” branches.

REGIMENTAL ABBREVIATIONS FROM ARMY LIST

Royal Horse Guards	..	..	..	R.H.G.
1st Life Guards	..	..	..	1 L.G.
1st Dragoon Guards	..	..	..	1 D.G.
1st Dragoons	..	..	..	1 Dgns.
3rd Hussars	..	..	..	3 Hrs.
5th Lancers	..	..	..	5 Lr.
Royal Horse Artillery	..	..	..	R.H.A.
" Field "	..	..	..	R.F.A.
" Garrison "	..	..	..	R.G.A.
Royal Engineers	..	..	..	R.E.
Royal Flying Corps	..	..	..	R.F.C.
Coldstream Guards	..	..	..	C. Gds.
Grenadier	..	..	..	G. Gds.
Scots	..	..	..	S. Gds.
Irish	..	..	..	I. Gds.
Welsh	..	..	..	W. Gds.
Argyll and Sutherland Highlanders	..	..	..	A. and S.H.
Bedfordshire Regiment	..	..	..	Bedf. R.
Berkshire Regiment, Royal	..	..	..	R. Berks R.
The Border Regiment	..	..	..	Bord. R.
Cameronian Highlanders	..	..	..	Camn. Highrs.
Cheshire Regiment	..	..	..	Ches. R.
Connaught Rangers	..	..	..	Conn. Rang.
Cornwall's Light Infantry, Duke of	..	..	..	D. of Corn. L.I.
Devonshire Regiment	..	..	..	Devon. R.
Dorsetshire Regiment	..	..	..	Dorset. R.
Dublin Fusiliers, Royal	..	..	..	R. Dub. Fus.
Durham Light Infantry	..	..	..	Durham L.I.
Essex Regiment	..	..	..	Essex R.
Gloucestershire Regiment	..	..	..	Glouc. R.

xxiv *Regimental Abbreviations from Army List*

Gordon Highlanders	..	..	..	Gord. Highrs.
Hampshire Regiment	..	..	..	Hamp. R.
Highland Light Infantry	..	..	..	High. L.I.
Inniskilling Fusiliers, Royal	..	..	..	R. Innis. Fus.
Irish Fusiliers, Royal	..	..	..	R. Ir. Fus.
Irish Rifles, Royal	..	..	..	R. Ir. Rif.
Kent Regiment, East	..	..	..	E. Kent R.
" " Royal West	..	..	..	R.W. Kent R.
King's Royal Rifle Corps	..	..	..	K.R. Rif. C.
Lancashire Fusiliers	..	..	..	Lancs Fus.
Lancashire Regiment, East	..	..	..	E. Lan. R.
" " Loyal North	..	..	..	N. Lan. R.
" " South	..	..	..	S. Lan. R.
" " Royal	..	..	..	R. Lan. R.
Leicestershire Regiment	..	..	..	Leic. R.
Leinster Regiment	..	..	..	Leins. R.
Lincolnshire Regiment	..	..	..	Linc. R.
Liverpool Regiment	..	..	..	L'pool R.
Manchester Regiment	..	..	..	Manchr. R.
Middlesex Regiment	..	..	..	Middx. R.
Munster Fusiliers, Royal	..	..	..	R. Muns. Fus.
Norfolk Regiment	..	..	..	Norf. R.
Northamptonshire Regiment	..	..	..	Norths. R.
Northumberland Fusiliers	..	..	..	Northd. Fus.
Nottinghamshire and Derbyshire Regiment	..	..	..	Notts and Derby R.
Oxfordshire and Buckinghamshire Light Infantry	..	..	..	Oxf. and Bucks L.I.
Rifle Brigade	..	..	..	Rif. Brig.
Royal Fusiliers	..	..	..	R. Fus.
Royal Highlanders	..	..	..	R. Highns.
Scots, Royal	..	..	..	R. Scots.
Scots Fusiliers, Royal	..	..	..	R. Scots Fus.
Scottish Borderers, King's Own	..	..	..	K.O. Scot. Bord.
Scottish Rifles	..	..	..	Scots Rif.
Seaforth Highlanders	..	..	..	Sea. Highrs.
Shropshire Light Infantry	..	..	..	Shrops. L.I.
Staffordshire Regiment, North	..	..	..	N. Staff. R.
Staffordshire " South	..	..	..	S. Staff. R.
Suffolk Regiment	..	..	..	Suff. R.
Surrey Regiment, East	..	..	..	E. Surr. R.
" " Royal West	..	..	..	R. W. Surr. R.
Sussex Regiment, Royal	..	..	..	R. Suss. R.
Wales Borderers, South	..	..	..	S. Wales Bord.

Warwickshire Regiment, Royal	..	..	..	R. War. R.
Welsh Fusiliers, Royal	..	..	..	R. Welsh Fus.
Welsh Regiment	..	..	..	Welsh R.
West Riding Regiment	..	..	..	W. Rid. R.
Wiltshire Regiment	..	..	..	Wilts R.
York and Lancaster Regiment	..	..	..	York and Lanc. R.
Yorkshire Light Infantry	..	..	..	Yorks L.I.
Yorkshire Regiment	..	..	..	York. R.
" " East	..	..	..	E. Yorks R.
" " West	..	..	..	2 W. Yorks R.



DEFINITIONS OF ADMINISTRATIVE TERMS

ACCOUTREMENTS.—Comprise belts, pouches, bandoliers, slings, mess-tins, haversacks, water-bottles, and similar articles (other than arms) carried outside the clothing.

ADMINISTRATIVE COMMANDER.—An officer vested with command of administrative troops only; *e.g.*, administrative commandants, directors of administrative services, and their representatives.

ADMINISTRATIVE DEPARTMENTS.—The departments of the Judge-Advocate-General, Principal Chaplain, and Paymaster-in-Chief.

ADMINISTRATIVE SERVICES.—Signal, Medical, Supplies, Transport, Ordnance, Railways, Works, Remounts, Veterinary, Postal.

ADMINISTRATIVE TROOPS.—Troops, combatant or otherwise, belonging to the administrative services, including R.E., other than those of field units; A.S.C., R.A.M.C., A.O.C., A.V.C., and A.P.C.

ADVANCED BASE.—The area within which may be situated the advanced depots of ammunition, supplies, animals, and material from which issues are made to field units.

ARMY HEADQUARTERS.—The headquarters of the commander of a group of Army Corps.

ARMY CORPS HEADQUARTERS.—The headquarters of the commander of a group of two or more Divisions.

BASE.—A place where the L. of C. originate, where magazines of stores for the forces in the field are situated and maintained under direct military management and control, and where the principal business of supplying these forces is located and organized under the military authorities.

BIVOUAC.—An encampment without tents or huts.

COMMANDER.—An officer vested with the command of a detachment, unit, or formation of fighting or administrative troops.

CONTRIBUTION.—A levy made on a town or community.

DIVISIONAL COLLECTING STATION.—A place where slightly wounded men who are able to walk are collected.

DRESSING STATION OR ADVANCED DRESSING STATION.—A place where wounded are collected and attended by the personnel of a field ambulance.

FIELD ARMY.—That portion of the forces in the field not allotted to fortresses, coast defences, or garrisons.

FIELD DEPOT.—A small temporary depot of supplies in the immediate vicinity of the field units.

FIELD UNITS.—Mobile units of the army allotted to divisions, cavalry divisions, brigades, army or corps troops, or L. of C. defence troops.

FORCES IN THE FIELD.—The whole of the forces in the field, allotted to garrisons, fortresses, etc., and on the L. of C. under the supreme command of the C.-in-C.

FIGHTING TROOPS.—Infantry, cavalry, artillery (including ammunition columns), flying corps, and engineer field units. The headquarters of commanders of fighting units are fighting troops.

FORMATIONS.—Groups of units under one commander, or groups of smaller formations under one headquarters.

GENERAL HEADQUARTERS.—The headquarters of the Commander-in-Chief.

LINES OF COMMUNICATION.—The system of communication by rail, road, and navigable waterways between the army and its base or bases of operations inclusive, together with the district through which they pass, within such limits as the C.-in-C. may determine.

L. OF C. DEFENCES.—The defences of that portion of the L. of C. for the security of which the commander of the L. of C. defences is made responsible by the C.-in-C., together with all fortifications and defences situated within that area.

L. OF C. DEFENCE TROOPS.—That portion of the army allotted for the defence of the Lines of Communication.

L. OF C. UNITS.—Administrative units on the L. of C. and under the command of the I.G.C.

- MAIN SUPPLY DEPOT.**—A depot of supplies situated at the advanced base or at a convenient point on the railway.
- MOBILIZATION.**—The process by which an armed force passes from a peace to a war footing. The mobilization of a unit means its completion for war in men, horses, and material.
- ORDERS, OPERATION.**—Orders which deal with all strategical and tactical operations and which include such information regarding supply, transport, etc., as it is necessary to publish to the troops.
- ORDERS, ROUTINE.**—Orders issued by the "A" and "Q" branches of a staff, relating to matters not concerned with operations, such as discipline, interior economy.
- RAILHEAD.**—A locality on the railway where ammunition and supplies are transferred to ammunition parks and supply columns.
- REFILLING POINTS.**—A place where divisional ammunition columns and supply sections of trains are refilled from ammunition parks and supply columns respectively.
- REGULATING STATION.**—A place where railway trains are marshalled, and whence they are despatched to railhead.
- RENDEZVOUS.**—Places where ammunition parks and supply columns are met by representatives of the headquarters concerned and directed to the refilling points.
- REQUISITION.**—A mode of making inhabitants of a district contribute supplies, labour, transport, etc., to an army. They must be paid for, but a requisition note does not imply promise to pay.
- SUPPLIES.**—Food, forage, fuel, light, and disinfectants.
- THEATRE OF OPERATIONS.**—The whole area of land or sea in which fighting may be expected or in which movements of troops are liable to interruption or interference by the enemy.
- TRAIN.**—Transport allotted to fighting units for the conveyance of the baggage stores and supplies necessary for their subsistence.



MILITARY ORGANIZATION AND ADMINISTRATION

CHAPTER I

ORGANIZATION OF THE ARMY FOR WAR

Organization of the Army—Units—Fighting Troops—Administrative Troops—War Establishments—War Equipment—Standardization—Tactical Organization—Formations—Table of Organization.

Of all military subjects, there is probably no one that is more cordially disliked than "Organization and Administration." That this is so is not to be wondered at, as the subject has been made into a bewildering mass of figures by most lecturers on the subject; yet there is no reason why this should be so. The only occasion when it becomes necessary for the soldier to make himself conversant with actual numbers of men, animals, vehicles, etc., is when he is personally responsible for compiling states of some unit, and it is only when he has been selected for Staff employment that it may become necessary for him to absorb the figures of more than one unit. In any case, an Officer charged with the duty of compiling returns of any particular unit or units will be supplied with a copy of the War Establishment of the unit, and from this he will obtain all necessary information.

It must not be supposed from these opening remarks that the subject is one which should be ignored on this account,

because there is a real need why the soldier should know something about, not only the strength and equipment of his own unit, but also of the units of other arms; but his knowledge need not extend beyond such information as will enable him to estimate the tactical strength and sphere of usefulness of the other units.

To illustrate the meaning of these remarks let us take a quite normal condition and place under the command of one Officer, an Advanced Guard composed of Infantry, Artillery, Engineers, Medical Unit, etc. He will not be particularly concerned with knowing the actual number of men, animals, and vehicles in his command, but he must certainly require to know how he can employ them, how he can distribute them, and what are their maximum powers in regard to their particular sphere of duty. His first task is to distribute his vanguard. He may select some Cavalry, Infantry, and a proportion of his Engineers for this duty. His first concern then will be, "How can I divide these units, since I want to hold some of them under my own command?" The essential point in his mind is, "Into what subdivisions are these units organized?" and his next thought, "What equipment have they got?" He can inquire, certainly, but his question will not gain him confidence. It is far better for him to know beforehand. The importance of such knowledge was illustrated on one occasion, at an examination. The scheme was an Advanced Guard. A river crossed the line of march, the bridge across the river had been destroyed, and the river was 250 feet wide; whilst the banks had a gradual slope with not very good approaches. Now a Field Company of Engineers had been allotted to this force, and, naturally, they were instructed to repair the bridge. By some miracle, not explained in the solutions offered, that Field Company constructed the bridge over this wide river, taking no time at all in com-

pleting the task—at least, none was allowed—and the Column moved a quantity of heavy transport over this bridge. Without going into the maximum power of that Field Company at this time, it can be positively stated that no such thing could have happened in real war. The candidates passed, however, and that was the special idea of the moment. Now we must know more about our jobs than that. The question is, “How much must we know?” That we shall try to learn.

Now, in the circumstances which we have just heard we should know how to split up the Infantry units, the Artillery, Engineers; and what is more, we must know their tactical value, extent of their equipment, and how they are organized, so that when splitting them up we send complete parts of a unit, with proper control over them.

In studying the organization of the army, it is necessary to remember that definite objects and principles have governed those who were primarily responsible for the assembly of units, and that the peculiar organization of every unit in the army is founded upon their studied needs in the battlefield. The object in sending an army into the field is to locate the enemy forces, engage, and, if possible, defeat them. To do this we must manoeuvre our troops into favourable positions, forcing the enemy to occupy ground which will give us an advantage. It must not be forgotten that the enemy will likewise try to gain the best position, and it may not be always possible to secure the ground we desire, so that we must be prepared to fight wherever the conditions may force us.

To get to the desired positions, we shall naturally have to move over all kinds of ground, and in an Empire which covers so broad a field as the British Empire does, it is evident that we shall be compelled to defend our interests on many different types of country, and under very different

climatic conditions. Wherever we may fight, however, the need for mobility is always present, and consequently we must equip our troops in such a way that they will be able to operate successfully, whether it be climbing the hills of India or crossing the desert of Egypt. It must be remembered that to change the organization according to the theatre of operations would be to sacrifice the efficiency of the forces, since it would be impossible to train sufficient troops to meet all possible conditions.

There is yet another aspect of military organization which must be considered—namely, the need for very definite control of even the smallest party of troops, the severity of the conditions of modern warfare being such as to test human endurance to the limit; and since the moments of actual contact are the moments when the need of control is most evident, and at the same time the most difficult, it can be readily understood that our control must extend down to the individual soldier.

Before one can begin to organize any unit, therefore, one must think of the control necessary, and limit the masses in accordance with the supervision which their employment in war renders practicable. In addition, one must remember the need of mobility, and as every body of troops requires transport for its effects, and has to be fed, clothed, equipped, and supplied with all its material needs, one must exercise care to provide the necessary personnel to attend to these matters.

We shall start our studies by taking the units themselves. A "unit" is a body of troops which is supervised by one man, which is organized for a specific purpose in war, and which carries with it all material requirements to enable it to perform its task, but which is dependent upon other units to keep it supplied with its future needs. Examples of the unit are found in the Cavalry Regiment, Battery of

Artillery, Battalion of Infantry, Field Company of Engineers, Field Ambulances, etc. These units are under a Commanding Officer, who is responsible for everything pertaining to the unit, and through whom all orders are issued. The unit is divided up into component parts, each of which may be employed separately, and in the larger units, these parts may be again subdivided into other parts, but each part would be under the control of an Officer or N.C.O., who would be responsible for everything in connection with that portion of the command.

The first thing considered in forming a fighting unit, is, to establish a certain definite fighting value. This is estimated in a round number of guns, sabres, or rifles. The needs of the force are then considered, and additional administrative personnel is added to deal with its immediate requirements. A supply of equipment is necessary to enable it to carry out its task, and arrangements for cooking the food of the men, temporary care when sick or wounded, etc., must be provided. Mobility must be considered, so that the equipment must be of a light nature. The organization is thus arrived at by a process of building up. To make the meaning quite clear, let us take an Infantry Battalion. The fighting value of this unit is 1,000 rifles. To this number of men we must add a few cooks, drivers, signallers, pioneers, stretcher-bearers, and a clerical staff, which raises our numbers above 1,000, without, however, increasing our fighting value. Thus the tactical strength of the Battalion is 1,000 rifles. Now to enable a force of 1,000 men to exist for a period of twenty-four hours, it is necessary to supply them with field kitchens; their rifles will consume a large quantity of ammunition, therefore ammunition wagons are necessary; medical attention without equipment is valueless, so we must provide a medical cart with stretchers and medical supplies; and we gradually build up the Battalion,

until it represents a fighting force of 1,000 men who are able to carry out an attack and who can move rapidly, carrying their immediate requirements with them.

Now we have said this unit can operate for a period of twenty-four hours, which means that someone must be responsible for its after-care, and so we must provide a relay of administrative troops to look after its future needs. The Battalion will not be operating by itself, so that we shall probably consider its future needs in conjunction with other units, and we may therefore arrange to build our administrative units up to meet the needs of a number of units, and this is exactly what we do. We create supply units, medical units, ordnance units, etc., which look after the needs of the fighting troops, and to facilitate the transport arrangements, we equip the units so that one administrative unit can look after a number of fighting units. How this is done we shall discuss in our administrative lectures.

Our conclusions so far have resulted in the discovery that the troops are classified in two categories:

Fighting troops, whose duty it is to locate, engage, and defeat the enemy, and

Administrative troops, whose duty it is to look after the material requirements of the fighting troops.

Units may belong to either one of these categories and consist of small compact commands operating under one commander, which are broken into smaller parts, each under efficient control. Fighting units are built up upon a fixed fighting value, whilst administrative units are organized to enable them to attend to the wants of a number of different fighting units.

WAR ESTABLISHMENTS.

For every unit that goes into the field, there is issued a fixed establishment, known as the War Establishment, by which the exact number of Officers and other ranks, animals,

and vehicles are fixed. This establishment may not be varied, except by the Commander-in-Chief. Its value lies in the fact that any Commander can tell the fighting strength of every unit in the field. He knows that a Company of Infantry has a tactical value of 200 rifles, and he knows, further, that every Company in his command has exactly the same value. The Supply Department know also that for each unit in the field there must be a fixed number of rations of food or forage *per diem*, and the rations being similarly fixed by a tariff, it becomes a matter of routine and mathematics to estimate the total tonnage to be sent to any particular body of troops each day. In organizing the administrative units, this is taken into consideration, and transport arranged accordingly. Now if it were permitted to vary this establishment, the consequence would be, that the whole transport service behind might be disarranged owing to the varying numbers. Where portions of a unit are detached, it is not so difficult because the transport has been built up with due regard to the organization of the units to be served, but increases to those parts may tax the capacity of the transport.

Given a fixed War Establishment, a Commander can estimate, therefore, the exact strength of his command, and he knows what the fighting power of the units is, and can be certain that no variation exists.

It is important that every unit in the field should have a War Establishment, and where new units are formed, the establishment must be promulgated in orders, so that the administrative services can be increased in proportion to requirements. In the same way, the clothing, official name, badges, ranks and pay of the new unit must be circulated so that all who come into contact with them may be able to recognize them and accept their authority.

It frequently happens that the Commander of a body of

troops will require to detach a portion of a unit for special duty with some other unit. He can do this without reference to higher authority, provided he does not increase the number of troops in his command, but he should promulgate the fact in orders, in order to facilitate the administrative work in readjusting the distribution of transport. Troops so temporarily transferred are shown as "attached."

EQUIPMENT OF AN ARMY.

In equipping an army even greater care must be exhibited than that shown in its organization. In the first place, the mobility of the force must not be impaired, yet its fighting value must be maintained by meeting all requirements. Careful estimates of its needs must be prepared, therefore, and the articles issued must be definitely tabulated in order to prevent omissions or overloading. War conditions being particularly severe, damage and loss are inevitable, consequently the replacement has to be considered as well as the first issue.

The equipment of every unit is fixed definitely by the Mobilization Equipment Regulations, and every article, except stores which are consumable, has a definite period of service. In the field there is no difficulty in getting equipment replaced, other than the difficulties of transport; but, at the same time, care must be taken that there is no undue wastage. Consumable stores are provided for, and frequent consignments are forwarded to meet immediate and future requirements.

Now in fixing the equipment to be carried by a unit, its fighting needs are taken first: arms, accoutrements, tools, ammunition, signal apparatus, bridging material, etc. Having fixed the total requirements, the next question is that of transport. The soldier carries a certain amount. His load must be carefully balanced so that he carries no

more than his physical powers will stand assuming that he is marching daily. The Cavalry horses can likewise carry a certain weight and no more. The arms and accoutrements must, therefore, be first considered, and then, having fixed the total weight which the man or animal is to carry, the balance of the weight must be divided between necessaries, clothing, and food. Now to insure that the soldier or animal is not overloaded, it is necessary to fix the weight and quality of every article, and then establish that as the standard to which all supplies must conform. The imperative need of this precaution is not always understood by the soldier, and very rarely by the civilian. By this means we protect the soldier and animal against overloading and consequent breakdown from exhaustion, an important matter for any army in the field. In the same way, the balance of the weight of equipment and supplies which must be carried is distributed amongst the transport, and in fixing the War Establishment of the unit, the two are considered together, so that the correct allotment is made. The animals drawing the loads daily will feel the strain as the war progresses, and since an advancing force is moving farther from its base, it becomes increasingly difficult to replace losses. The maximum weight of the vehicle must be fixed, therefore, and every article that goes to make up its load must be defined.

We have previously referred to the fact that the War Establishment must not be increased, and here we get one reason. Every additional soldier means an increase in weight for every vehicle that has to carry forward supplies to the unit where the increase has been made, and eventually that extra weight will result in a breakdown of the transport animals. The weight must be considered, therefore, and every vehicle must have a fixed load to prevent possible mishap.

In allotting the transport, the conditions under which it must operate must be considered. If the transport must accompany the unit wherever it goes, it must be of a type to negotiate any kind of country; and if it is to come under fire, then it must be of a type capable of being moved at a faster pace than a walk. The load, therefore, is affected by the type of wagon and its duty. The farther back the transport is, then the heavier type of vehicle it may be.

We have previously referred to the war strain and the consequent losses. To reduce wastage to a minimum, the whole of the equipment is standardized, or, in other words, is made interchangeable. Every part is definitely fixed as to the pattern, make, material, and weight, consequently all similar articles in use are identical in every respect. The result of this precaution is, that damaged articles may be used to repair other damaged articles by utilizing the sound parts in assembling the salvaged parts of other and similar articles. A great saving is accomplished as a result of this very wise precaution.

A source of endless amusement to the lay mind, and one of irritation to many soldiers, is the definite names which are applied to every article used in the army. To refer to the wire which you require for some particular purpose as "Wire, galvanized steel No. 18, S.W.G. 2 strand, barbed," may seem to be unnecessary, but imagine yourself two hundred miles from an advanced base, and you ask for "some barbed wire" where a number of different kinds are used, and imagine the difficulty which confronts the man who only has your vague request whereby he can gauge your wants, and you will readily realize that in an organization so huge as an army, and with such a broad vocabulary of stores, it becomes highly important that there shall be one definite name for every article used; and since peacetime training should have made the soldier acquainted with

these articles, he should have had lots of time to make himself familiar with the correct name for the article.

This process of standardizing articles is carried down to the smallest article; consequently, your field biscuit has a standard quality. It is baked at a certain temperature, being made out of a fixed quality of ingredients. It is packed in fixed quantities, and the box which carries it has a standard of weight, size, and quantity inside, consequently it simplifies transport, distribution, etc., while insuring that no undue strain is thrown on any animal or man in the field, and the soldier gets the maximum food value.

The result of our discussion so far has been, to bring before you a few important facts which must be considered in regard to the organization and equipment of the army. It is impossible to discuss the subject in all its details, but if these general principles are borne in mind, and if one uses a little thought when it becomes necessary to note any particular matter, it will be a subject of unusual interest to discover not only how a thing is done, but also the whys and wherefores. These can usually be arrived at by first making an appreciation of the purpose of the unit, next the material which it requires to perform its duties, and, lastly, what the relation of the unit is to other units. Having answered these questions to your own satisfaction, you will usually find the explanation suggesting itself.

It is well for us to make a mental note of the fact, that it is rarely that reasons for doing certain things can be profitably circulated, and it is therefore ill-advised to make criticisms without being armed with the reasons for any particular step. To do so usually indicates that your views of the army are quite superficial, which may be detrimental to your own interests, and certainly is not calculated to improve your standing in the eyes of the higher authorities,

who are perhaps better situated as regards information, and consequently do not credit you with power of discernment, however complex the matter may appear to the uninformed.

TACTICAL ORGANIZATION.

The material point which we have to consider now is, "What shall we study, and to what extent?" The answer we shall now try to give.

First of all we must learn the fighting value or the administrative value of every unit. Then we must learn how it is organized within itself, to enable it to perform its duties. Next the total amount of equipment which it carries, and the distribution of same within the component parts of the unit.

Armed with this information, we shall be able to take command of any mixed body of troops, and to intelligently issue orders for their subdivision and employment, and also to arrange for their care by taking the necessary steps to adjust the administrative transport to suit the circumstances.

To facilitate future reference, this information has been embodied in tabular form, so that a rapid glance will give all the essential factors opposite the name of the unit. In this table round numbers only have been used. To obtain the exact figures reference must be made to the latest War Establishments with any amendments. For all practical purposes, the figures contained in the Field Service Pocket Book may be used, although it must be remembered that they are *not* correct. This is an intentional fault, since a book so widely published could be easily obtained by enemy agents, for which reason only working figures are given. The only occasion when actual figures become necessary is when working up examinations, or, as has already been stated, when an Officer is personally responsible for compiling

states and returns regarding certain units, in which case he will be armed with the necessary information.

In giving the equipment carried, it must be understood that the principle of round numbers only is used, since they are easier to commit to memory. The extra material to replace breakage, spare parts, etc., is not shown. Similarly the organization is given from the view-point of the tactical distribution, those parts which can be separated being shown, together with their equipment. If extra equipment is required, then part of other sections may be detached and added to that which is already carried.

TABLE I.—TACTICAL ORGANIZATION AND EQUIPMENT IN THE FIELD OF MOBILE FIGHTING UNITS.

Unit.	Organization and Equipment.	Road Spaces.		Camp Area.
		Troops.	Transp.	
		Yards.	Yards.	Yards.
ARTILLERY :				
<i>Horse Art. Batt.</i>	4 or 6 15-pdr. Q.-F. guns	440	90	75 × 150
<i>Field Art. Batt.</i>	4 or 6 18-pdr. Q.-F. guns	390	65	75 × 150
<i>Howitzer Batt.</i>	4 or 6 4-5" guns	390	65	75 × 150
<i>Sect. Field Art.</i>	2 guns with 4 amm. wagons	—	—	—
<i>Subsect. F. Art.</i>	1 gun with 2 amm. wagons	—	—	—
FIELD ART. BDE.	H.Q. and 4 4-gun batts., or	6-gun batteries with <i>Horse Artillery Bdes.</i> <i>Field and Howr. Bdes.</i> 4-gun batteries, <i>Field and Howr. Bdes.</i>		
<i>Horse, Field, or</i>	H.Q. and 3 6-gun batts.			
<i>Howr.</i>	H.Q. carries 7½ miles of cable and telephones, range finders, etc., and 120 sets of digging tools. Ammunition columns are no longer part of Brigade, except R.H.A.			
<i>Heavy Battery</i>	4 60-pdr. guns and amm. column, 15 sets of tools	380	55	60 × 150
	<i>Note.</i> —All field and heavy guns have two first-line ammunition wagons with each gun in battery.			

Unit.	Organization and Equipment.	Road Spaces.		Camp Area.
		Troops.	Transp.	
SIEGE ARTILLERY:		Yards.	Yards.	Yards.
<i>Siege Guns</i> ..	A battery consists of 2 guns and amm. column. Armament: 6", 9·2", 12"2, and 15" B.L. Q.-F. guns on field carriages, tractor or horse drawn, or railway mountings ..	—	—	—
<i>Siege Howitzers</i>	Siege batteries as for guns. Armament: 6", 8", 9·2", 12", and 15"	—	—	—
<i>Garrison Art.</i>	Fixed armament of varying calibres. Crews formed into companies and sections	—	—	—
AMM. UNITS	(See under heading.)			
CAVALRY:				
<i>Regiment</i> ..	H.Q., M.-G. section and 3 squadrons; 600 sabres, 2 or 4 M.-G. H.Q. has 2 tripartite boats for fording streams; 15 sets of tools	570	480	160 × 150
<i>Squadron</i> ..	H.Q. and 4 troops. Has 5 sets of tools, 1 limber wagon, and 2 pack-animals for S.A.A., 150 sabres	160	95	50 × 150
<i>Troop</i> ..	H.Q. and 4 sects., 30 sabres	40	—	—
<i>M.-G. Section</i>	2 or 4 M.-G., carried on 2 limbers	—	80	—
<i>Divisional Sqn.</i>	Same as above, with 10 extra sets of tools ..	—	—	—
	<i>Note.</i> —Yeomanry have same organization as cavalry, with 4 squadrons to a regiment. Cavalry carry rifles, but allowance must be made for horse-holders.			
INFANTRY:				
<i>Battalion</i> ..	H.Q., M.-G. section, 4 companies. Carries 100 sets of tools. 1,000 rifles, 4 M.-G., 16 Lewis guns	590	210	75 × 150
<i>Company</i> ..	H.Q., 4 platoons, 200 rifles, 4 Lewis guns	125	15	15 × 150

Unit.	Organization and Equipment.	Road Spaces.		Camp Area.
		Troops.	Transp.	
INFANTRY:		Yards.	Yards.	Yards.
<i>Platoon</i> ..	H.Q., 4 sections, 50 rifles, 1 Lewis gun	30	—	—
<i>M.-G. Section</i>	4 M.-G., carried on 2 limbers	—	30	—
PIONEERS:				
<i>Battalion</i> ..	H.Q., M.-G. section, 4 companies, 1,000 rifles, 4 M.-G., 16 Lewis guns, 500 sets of tools	895	—	100 × 150
<i>Company</i> ..	H.Q., 4 platoons, 200 rifles, 4 Lewis guns, 125 sets of tools	185	—	25 × 150
<i>Platoon</i> ..	H.Q., 4 sections, 50 rifles, 1 Lewis gun	—	—	—
	<i>Note.</i> —This unit is equipped for fighting, but carries extra tools as light engineering unit.			
CYCLISTS:				
<i>Company</i> ..	H.Q., 6 platoons, 200 rifles	600	—	15 × 150
<i>Platoon</i> ..	H.Q., 4 sections, 30 rifles	100	—	—
M.-G. UNITS:				
<i>Brigade M.-G. Company</i>	H.Q., 4 sections; has 16 M.-G. with limbers for guns and S.A.A.	300	—	15 × 150
<i>Sect. M.-G. Co.</i>	H.Q., 4 squadrons, 4 M.-G.	80	—	—
<i>Motor M.-G. Battery</i>	H.Q., 3 sections, 6 M.-G. carried on motor-cycle side-cars. Each gun has 2 S.A.A. cars in addition; 1 repair car	400	—	10 × 150
<i>Section M.-G. Battery</i>	H.Q. and 2 squads, 2 M.-G. on cars	100	—	—
ROYAL FLYING CORPS:				
<i>Aircraft Park</i>	H.Q. and 4 wings of 3 squadrons each, 144 aeroplanes, repair shop, and wireless equipment; tractors and carriers	—	—	—
<i>Flying Wing</i> ..	H.Q. and 3 squadrons, 36 aeroplanes	—	—	—
<i>Flying Squadron</i>	H.Q., with 12 aeroplanes ..	—	—	—
<i>Kite Balloon Squadron</i>	H.Q. and 2 sections; 1 balloon each	—	—	—

TABLE II.—TACTICAL ORGANIZATION AND EQUIPMENT OF ENGINEER UNITS.

<i>Unit.</i>	<i>Organization and Equipment.</i>	<i>Road Spaces.</i>	<i>Camp Area.</i>
<i>Field Squadron..</i>	H.Q., bridging detachment, and 4 troops. Bridging detachment has 8 tripartite boats for fording streams. H.Q. carries technical tools	Yards. 590	Yards. 70 × 150
<i>Troop</i>	H.Q., 4 sections. Carries 24 sets of tools, pump, explosives	—	—
<i>Field Troop ..</i>	H.Q., 4 sections. Carries 2 collapsible boats, and 35 sets of tools	200	50 × 150
<i>Field Company ..</i>	H.Q., 4 sections and bridging detachment. Bridging material to construct 75 yards of medium bridging. 160 sets tools, explosives, etc. ..	490	30 × 150
<i>Section Company</i>	Carries 40 sets tools, explosives, survey instruments, pumps, etc.	80	—
<i>Pontoon Park ..</i>	Carries bridging material to construct 210 yards pontoon, and 40 yards trestle, medium bridge	1,200	100 × 170
<i>Tunnelling Co. ..</i>	H.Q. and 4 sections of 3 reliefs each. Carries special miners' tools and equipment; 300 all ranks, 60 wagons. Each relief has 1 N.C.O. and 20 privates.		
<i>Fortress Co. ..</i>	Carries special equipment for field fortifications. Has 100 working ranks.		
<i>Field Searchlight Co.</i>	Carries 2 90 c.m. and 4 60 c.m. searchlights, with 4 oxy-acetylene lights.		
<i>Anti - Aircraft Searchlight Sect.</i>	Carries 3 searchlights and equipment.		
<i>Topographical Section</i>	Attached H.Q. and supplies draughtsmen, photographers, etc. Carries photographic apparatus.		
<i>Printing Sect. ..</i>	Carries printing apparatus on motor lorry.		
<i>Meteorological Sect.</i>	Weather Bureau Staff for weather records, etc.		
<i>Railway Construction Cos.</i>	Formed from specially trained troops, and allotted to lines of communication as required.		
<i>Labour Battalion</i>	H.Q., 4 companies. Officers are R.E.; company formed from labourers. 1,000 workmen.		
<i>R.E. Companies</i>	H.Q., and 10 relief sections of 30 men each.		
<i>Forestry Battalion</i>	H.Q., and 4 companies, 1,000 labourers.		

TABLE III.—TACTICAL ORGANIZATION AND EQUIPMENT OF SIGNAL UNITS.

Unit.	Organization and Equipment.	Road Space.	Camp Area.
		Yards.	Yards.
<i>Signal Squadron</i>	H. Q., and 4 troops, as below ..	625	75 × 175
“A” Troop ..	Carries 2 wireless wagon stations.		
“B” Troop ..	2 cable detachments with 28 miles cable and 8 vibrator stations.		
“C” Troop ..	1 wagon and 3 pack wireless sets.		
“D” Troop ..	Supplies 50 despatch riders, etc.		
<i>Signal Troop</i>	Carries 7½ miles cable and 8 portable telephones	75	50 × 60
<i>Signal Troop (detached)</i> ..	Add 2 pack wireless sets ..	—	—
<i>Division Signal Company</i> ..	H. Q. and 4 sections as below ..	420	75 × 150
<i>No. 1 Section</i> ..	Carries 30 miles cable, 9 offices	125	50 × 100
<i>Nos. 2, 3, 4 Sections, each</i> ..	8 miles cable, 10 telephones ..	45	—
<i>Air-Line Section</i>	H. Q., 2 detachments. Carries 20 miles air-line with 4 offices. Can maintain 40 miles of line	130	40 × 80
<i>Cable Section</i> ..	H. Q., and 2 detachments. Each detachment has 10 miles cable, 2 offices	90	50 × 50
<i>Wireless Section</i>	Carries 3 wireless wagon sets ..	120	40 × 80
<i>Pack Section</i> ..	Carries 1 wireless pack set ..	10	—

TABLE IV.—MEDICAL UNITS IN THE FIELD.

Unit.	Organization and Equipment.	Road Space.	Camp Area.
		Yards.	Yards.
<i>Cavalry Field Ambulance</i>	H. Q., and 2 sections. Each section can accommodate 25 patients. Has 4 six-horse and 6 two-horse ambulances. (See note)	290	80 × 180
<i>Field Ambulance</i>	H. Q., and 3 sections. Each section can accommodate 50 patients. Has 8 motor ambulances. (See note) ..	380	120 × 200
	<i>Note.</i> —Each field ambulance has compact sections having personnel, transport, and equipment, which can be detached as required.		

<i>Unit.</i>	<i>Organization and Equipment.</i>
<i>Motor Ambulance Convoy</i> ..	H.Q. and 3 sections. Has 50 motor ambulances.
<i>Casualty Clearing Hospital</i>	Provides accommodation for 200 cases. Evacuates to rail.
<i>Ambulance Train</i>	Provides accommodation for 396 cases.
<i>Stationary Hosp.</i>	" " " 400 "
<i>General Hosp. Ambulance</i>	" " " 1,040 "
<i>Flotilla</i>	H.Q. and 6 barges. Each barge has 30 beds.
<i>Hospital Ship</i>	Has accommodation for 220 helpless cases.
<i>Mobile Laboratory</i>	Carried on motor vehicles. Used for scientific research.
<i>Sanitary Sects. Convalescent Depots</i>	Allotted to formations for sanitary duties. Provide accommodation for 1,000 cases.
Veterinary Units.	
<i>Veterinary Sect.</i>	Mobile units accompanying divisions to tend sick or injured animals.
<i>Veterinary Hosp. Convalescent Depots</i>	Accommodates 1,000 animals. Accommodate 1,250 animals.
Remount Units.	
<i>Remount Sqn.</i>	Tends 500 animals, and provides grooms to deliver remounts to units in the field.
<i>Remount Depots</i>	H.Q., and 3 or more squadrons.

TABLE V.—ORGANIZATION AND EQUIPMENT OF AMMUNITION SUPPLY UNITS.

<i>Unit.</i>	<i>Organization and Equipment.</i>
<i>Cavalry Ammunition Park</i>	H.Q., 2 sections. No. 1 section carries 15-pdr. ammunition in 13 three-ton lorries. No. 2 section S.A.A. in 10 three-ton lorries. Supplies 1 cavalry division.
<i>Cavalry Brigade Amm. Park</i>	Carries 15-pdr. ammunition in 4 three-ton lorries, and S.A.A. in 3 three-ton lorries. Spare parts in 1 lorry.

Unit.	Organization and Equipment.
<i>Divisional Ammunition Column</i>	<p>H.Q., and 2 echelons. "A" echelon is divided into 3 sections. Each section has equal distribution of wagons for artillery and S.A. ammunition. One wagon is provided for each gun in the division.</p> <p>"B" echelon has 1 section only, and acts as the connecting-link between the corps ammunition unit and the advanced sections.</p>
<i>Ammunition Sub-Park</i>	<p>H.Q. and 2 sections. No. 1 section carries 15 and 18 pdr. ammunition in 17 three-ton lorries. No. 2 section carries 4.5 and S.A.A. in 4 and 11 three-ton lorries respectively.</p>
<i>Corps Ammunition Park</i>	<p>H.Q. carries R. Eng. and Art. technical stores in 3 three-ton lorries. Transport is mechanical.</p>
<i>Army Artillery Amm. Park</i>	<p>H.Q., and the sub-parks belonging to the divisions in the corps which are massed for control.</p>
<i>General Headquarters Park</i>	<p>H.Q. and 2 sections. Supplies heavy artillery units. Each section has 13 three-ton lorries for ammunition. H.Q. carries technical stores in 1 lorry, and repair equipment in 1 lorry.</p> <p>H.Q. and 3 sections. Headquarters carries spare and relief lorries, workshops, and stores. Ammunition is carried in three-ton lorries as follows: No. 1 sec. 25; No. 2 sec. 30; No. 3 sec. 50; total 105.</p>
<p><i>Note.</i>—Ammunition parks are supplied by A.S.C., and carry a small number of artillery details to look after ammunition.</p>	
<p>Ordnance Units and Workshops.</p>	
<i>Anti-Aircraft Gun Workshops</i>	<p>Allotted to three detachments of two guns each for care of guns, etc. Has 2 workshop lorries.</p>
<i>Ordnance Traveling Workshop</i>	<p>Carries workshop and stores on 2 lorries. The crews are expert artificers.</p>
<i>Heavy Mobile Workshop</i>	<p>Carries heavy equipment on 4 workshop trucks drawn by steam tractors.</p>
<i>Ordnance Company</i>	<p>Consists of 150 artificers with necessary headquarters, etc.</p>
<i>Ordnance Depot</i>	<p>The personnel is supplied by allotting the number of ordnance companies required, and adding the necessary administrative staff.</p>

TABLE VI.—TACTICAL ORGANIZATION AND EQUIPMENT OF SUPPLY UNITS.

Unit.	Organization and Equipment.
<i>Cavalry Supply Column</i>	H.Q. and 2 sections. Each section is divided into two parts, transport and supply. Each section has 54 supply lorries and 1 postal service lorry. H.Q. has 11 workshop lorries. Total vehicles 148. Personnel 800.
<i>Cavalry Brigade Supply Column</i>	H.Q. and 2 sections. Each section has 13 supply and 1 postal lorries. H.Q. carries workshop on 3 lorries. Total vehicles 36. Personnel 220.
<i>Divisional Train</i>	H.Q. and 4 horse transport companies. Each company is divided into two parts, baggage and supply. H.Q. company (No. 1) has 47 baggage and 53 supply vehicles. Nos. 2, 3, and 4 sections have 17 baggage and 10 supply vehicles. Total number of vehicles 245. Personnel 530.
<i>Road Space.</i>	
<i>Divisional Supply Column</i>	H.Q., 40 yards. H.Q. (No. 1) company, 740 yards. Nos. 2, 3, and 4, each 310 yards. Total train, 1,755 yards. Divided into two parts, transport and workshop details, and supply details. Carries 30 supply and postal service, 4 ordnance, and 14 forage lorries, with added spares, reliefs, etc. Supplies 1 infantry division.
<i>Corps Troops Supply Column</i>	Has 4 supply, 1 ordnance, 1 postal, 1 forage and sundry detail lorries. Total vehicles 7.
<i>Army Troops Supply Column</i>	Has 3 supply and 1 workshop lorries.
<i>Reserve Park</i> ..	Carries reserve supplies in 144 vehicles. Consists of 1 horse transport company A.S.C.
<i>Field Bakery</i> ..	Carries personnel to construct and man 6 bakery sections of 10 ovens each. Can provide for 26,000 men.
<i>Field Butchery</i> ..	Has 3 butchery squads capable of killing and dressing meat for 22,500 men.
<i>Railway Supply Detachment</i>	Provides escort for supplies during railway journey.
<i>Railhead ditto</i> ..	Provides personnel for issues at railhead.
<i>Depot Unit of Supply</i>	Capable of feeding 4,000 men and 1,000 animals.

<i>Unit.</i>	<i>Organization and Equipment.</i>
<i>Bakery Section</i> ..	Added to depot as above. Can bake 4,320 rations of bread in 10 ovens in 12½ hours, or 5,400 rations in steam wagon ovens in 12 hours.
<i>A.S.C. Labour Company</i>	H.Q. and 5 sections. Each section is divided into 2 subsections. A subsection is divided into 2 gangs of 25 men under a corporal ganger. Total labour available, 500 men.
<i>Requisition Bureaus</i>	Units situated on or near lines of communication to adjust accounts of all material or labour provided under requisition.

TABLE VII.—TACTICAL ORGANIZATION AND EQUIPMENT OF TRANSPORT UNITS.

<i>Unit.</i>	<i>Organization and Equipment.</i>
<i>Horse Transport Units.</i>	
<i>Army Auxiliary Company</i>	H.Q. and 3 sections. Each section has 29 wagons for stores, besides wagons for their own supply.
<i>Advanced H.T. Depot</i>	H.Q. and 4 sections. For R.E., R.A., A.S.C., and pack section for Indian units. Has a total of 150 vehicles for transport services.
<i>Base H.T. Co.</i> ..	1 horse transport company. A.S.C. as above.
<i>Auxiliary Lines of Communication, H.T. Company</i>	H.Q. and 3 sections of 20 two-horse vehicles each.
<i>Mechanical Transport Units.</i>	
<i>Advanced M.T. Company</i> } <i>Base M.T. Co.</i> } <i>Auxiliary M.T. Companies</i> }	Personnel provided for driving cars requisitioned, or surplus to establishments.
<i>L. of C.</i>	H.Q. and 3 sections of 15 steam lorries each.
<i>Auxiliary M.T. Omnibus</i>	H.Q. and 3 sections of 15 petrol lorries each.
	H.Q. and 2 sections of 37 omnibuses each.

FORMATIONS.

Assembly of Units.—When a number of units are assembled together, we usually describe the mass which they form as a “formation.” Formations may be composed of units wholly from one arm of the Service, or a mixed force composed of different arms. As in the case of the unit, the first consideration is to provide a certain fighting value to the force. The “unit” is a small fighting power under the leadership of one Officer, but as the power to personally supervise the operations of a body of men is much restricted, owing to the unavoidable confusion of battle, the size of the unit must necessarily make it of little value in undertaking the larger offensive operations of war. Under these circumstances it becomes necessary to increase the fighting power of the forces by grouping a number of units together, and in order to insure co-ordination of action, they are all placed under one Headquarters. According to the extent of the operation to be undertaken, it will be necessary to increase the size of the formations; as the distance which the formation will be removed from the main body is lengthened out, so the necessity of making the offensive power greater becomes apparent. If the force is to be detached for a great distance, it must be supplied with its own administrative units, in order to maintain itself. When we have provided the force with sufficient administrative units and transport to meet all its requirements, we speak of it as being “self-contained.” The smaller groups are usually composed of one arm, and as they are not intended to operate as a detached force, but simply give an increased fighting weight to the Commander, we call them “tactical formations,” as their sphere of action brings them within the scope of tactics. The larger formations which we use for the

broader plans are self-contained, and provide the pieces which are used in the strategic plans, so we call these the "strategic formations." It must be fully appreciated, however, that the force which moves as a whole, in conjunction with certain strategic intentions, must sooner or later come into contact with the enemy, and consequently it will have to become a tactical formation, or, rather, its parts will become tactical bodies. As this is the case, the larger or strategic formations are formed by grouping the smaller tactical formations under one command. By adding administrative units to cover all requirements we assemble the masses used in the strategical campaign.

In assembling formations which are composed of more than one arm, certain definite principles govern. In the first place, the decisive factor in battle is the bayonet or sabre, the weapons used in close quarters; and it is by the number of guns, rifles, or sabres, that we estimate the fighting value of a force. The aim of every Commander is to get to close quarters, dislodge his enemy from position and inflict a decisive blow upon him with bayonet or sabre. As our Field Service Regulations tell us, "the assault is the climax of the infantry attack," and the aim of the whole force must be to get into actual contact with the enemy. Once he is dislodged the pursuit is steady and continuous, with the object of denying the enemy time in which to reorganize his forces, and to completely rout his troops before they can be reorganized. Prior to the assault it is the infantry who must be considered, since they provide the assaulting force, and after, the large bodies of cavalry who will press the advantage gained. Now the advance of the infantry will be by leaps and bounds, regulated by the fire which the enemy can bring to bear. From time to time the infantry will be held up by hostile fire; positions which the enemy has placed in advance must be taken,

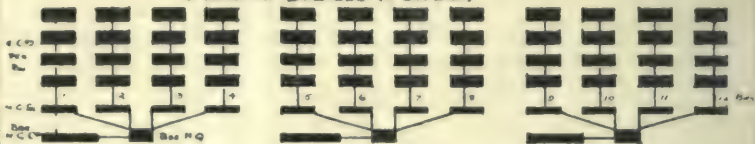
and on each of these occasions there will be a fire fight of varying duration. At this time there must be supporting fire from artillery, and when the advance is again resumed, the enemy fire will have to be checked by artillery covering fire, otherwise the infantry could not advance.

The enemy will utilize every possible resource to prevent our advance, and it will probably be necessary to have engineers to destroy obstacles, or, during the fire fight, to help the troops in the construction of cover, and units of this arm must be detailed. Casualties will occur which must be removed, and the Medical Service must be represented by mobile ambulances. The whole force must be kept in touch, and as its frontage will be extended according to the size of the force engaged, it will be necessary to supply signal personnel and equipment for this purpose. In addition to these units there is the question of feeding, clothing, replenishing of other stores, etc., to be considered, so that we must add units for these purposes.

Having decided what tactical strength is necessary, arrangements are made to supply the personnel and equipment that has been mentioned above, and since we depend upon certain fixed establishments for our formations, the organization of the various units is made to conform to the formation to which they are attached in order to simplify administration.

The smallest formation is the Brigade, which is a tactical formation. This consists of a force of cavalry or infantry under a Headquarters. Having no administrative units attached, its sphere of activity is limited to the zone occupied by superior forces, although the addition of these details would enable a Commander to detach a Brigade for special duties. (Examples are shown in the accompanying table, in the form of a Detached Cavalry Brigade, or a Provisional Infantry Brigade.) The extent of their operations would

3 INFANTRY BRIGADES (4 Bns Each)



3 FIELD ARTILLERY BRIGADES (3-6 guns 15 Pdr Batts Each)



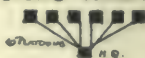
MOTOR M.G. BATTERY.



1-4 5 1/2 in. FIELD HOWITZER BRIGADE



DIV. CYCLIST COMPANY.



DIVISIONAL AMMUNITION COLUMN



PIONEER BATTALION



CAVALRY SQUADRON



3 FIELD COMPANIES ENGINEERS.



DIV. H.Q. ARTILLERY.



DIVISIONAL H.Q.



DIV. H.Q. ENGINEERS.



3 FIELD AMBULANCES.



SANITARY SECTION.



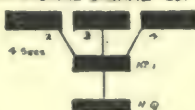
MOBILE VEH. SEC.



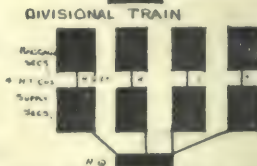
MOTOR AMB. WORKSHOP



DIVISIONAL SIGNAL CO.



TACTICAL COMPOSITION OF AN INFANTRY DIVISION.



EXTRA DIVISIONAL TROOPS ATTACHED TO CORPS.

- 1 AMMUNITION SUB-PARK
- 1 CASUALTY CLEARING HOSPITAL (200 BEDS)
- 1/2 MOTOR AMBULANCE CONVOY (1 Pdr Corps)
- 1 DIVISIONAL SUPPLY COLUMN.

NOTE - For Each Division in the Field these units must be provided to supply material requirements

EXTRA TROOPS PER DIVISION ON LINES OF COMMUNICATION.

- 1 RESERVE SUPPLY PARK (2 DAYS SUPPLY)
- 1 FIELD BAKERY & 1 FIELD BUTCHERY
- 1 HOSPITAL TRAIN (300 BEDS)
- 1 STATIONARY HOSPITAL (400 BEDS)
- 1 GENERAL HOSPITAL (1000 BEDS)
- 1 HOSPITAL SHIP (220 BOTS)

G. H. Collins
R.M.O.

be limited to reasonable transport distances which could be covered daily by their supply transport.

The Division is the standard unit upon which the British Army was originally based. It consists of a number of units of different arms, and is self-contained. Recent experience has shown that Corps are the model formations now, and they will doubtless be the standard adopted in our new and, let us hope, larger armies. The Division illustrates the principles we have discussed very clearly. Here you see the fighting strength represented by a certain number of Brigades, around which a certain number of necessary units have been assembled, providing for their immediate requirements, in addition to which transport is available for future needs. It will be noted that the number of units agrees in the case of Infantry and Artillery Brigades, Field Companies of Engineers, and Field Ambulances, whilst reference to the organization of units will show you that the organization of those units corresponds to these groups in so far as their interior parts are concerned. For instance, an Infantry Brigade consists of four battalions, a Field Company of Engineers supports each Brigade and is organized into four sections.

Now the equipment carried in a Division is sufficient for immediate needs, but during the fire battle it may become necessary to increase the weight of Artillery, or in an advance we may find a large bridge destroyed which cannot be bridged with the light material carried by a Division. Under these circumstances we must enlist the aid of Heavy Artillery and Pontoon Parks respectively. Now, if we added these units to a Division, their very weight and transport would force the Division to conform to their lesser rate of march, and consequently we should instantly remove some of the mobility of our forces, which we cannot afford to do. To meet the situation, the heavier equipment is

moved in the rear of the other troops, and is massed under the heading of Corps or Army troops, according to which they are attached. They are then available when required, but do not hamper the manœuvring troops.

A Corps consists of two or more Divisions, usually three, with a proportion of Corps troops attached.

An Army is composed of two or more Corps, usually three, with a proportion of Army troops.

The grouping of the units, therefore, commences with the smaller tactical formations, which are again grouped into a larger formation, to which is added sufficient administrative troops to attend to the whole. These larger groups are then again massed, with the addition of heavier equipment, under another Commander, and then these larger formations are again grouped, and even more equipment added, under the largest command, the Armies.

By these successive steps we establish a series of Headquarters, through which all commands are sent, so that whilst a large formation may be detailed to a task, the Commander of the large body may distribute his command in accordance with his plans, and as the force lends itself to distribution, he can detach any portion, knowing that he will have a competent authority in charge of that particular portion, and that the equipment it carries is sufficient for its immediate needs.

In a huge war, such as is raging now, where the battle resolves itself into a standing line, it naturally follows that the equipment which has been carried in the rear formations has been pushed forward toward the firing-line, and in many cases is actually operating side by side with the smaller formations. Under these conditions, it is a simple matter to "attach" these units to the lesser formations during the continuance of the sedentary warfare, but as the mobile forces make their dashes forward, it would be more than

their transport or command could do to attend to the detail of assembling and moving the larger units, so that the latter would return to their former formations as a matter of course. When units are thus thrown forward, the necessary steps are taken to increase the administrative personnel and transport in advance, in order that they can cope with the increased weight and work, so that what has already been stated takes effect. The "attachments" are promulgated in orders, and the necessary adjustments likewise made and authorized in orders.

Before proceeding to enumerate the various formations and their tactical values, it may be as well for us to memorize a few important definitions, since we shall constantly refer to them in subsequent lectures.

Formations are groups of units assembled under one command, or groups of smaller formations with additional equipment and personnel, grouped under one Headquarters.

Corps Troops or Army Troops are bodies of troops which are placed at the disposal of the commanders of the Corps or Armies, and which do not form a part of the smaller formations which form the large ones.

Tactical Formations are those groups of units which are restricted in the distance at which they can operate from the main army, owing to their lack of supporting administrative units. They are used to give a striking force in battle.

Strategical Formations are those formations, formed by grouping smaller formations, which are self-contained, and which can be used at a distance from the main forces.

We shall now define the different regular formations of the British Army, giving their tactical values. These are recommended for future study in grasping the details which have been described in this lecture. Where there is apt to be variation in numbers, the differences are shown in brackets.

A Cavalry Brigade.

Brigade Headquarters.	|	3 Cavalry Regiments: 1,500 sabres,
Brigade Machine-Gun Squadron: 16 M.-G.		12 M.-G. (6 M.-G.).
		1 Signal Troop R.E.

Tactical value, 1,500 sabres, 28 M.-G. (22 M.-G.).

Cavalry Brigade when Detached from a Division.

Brigade Headquarters.	|	1 Field Troop R.E.
Brigade M.-G. Company: 16 M.-G.		1 Signal Troop R.E.
3 Cavalry Regiments, 12 M.-G. (6 M.-G.).		1 Cavalry Field Ambulance.
1 Horse Artillery Battery: 6 guns.		1 Ammunition Column.

Tactical value, 1,500 sabres, 6 guns, 28 M.-G. (22 M.-G.).

An Infantry Brigade.

Brigade Headquarters.	|	4 Battalions Infantry: 4,000 rifles,
Brigade M.-G. Company: 16 M.-G., 2 Lewis guns.		16 M.-G., 64 Lewis guns.

Tactical value, 4,000 rifles, 32 M.-G., 66 Lewis guns.
Brigade Headquarters carries 500 sets digging tools.

Provisional Infantry Brigade.

Brigade Headquarters.	|	1 Ammunition Column.
Brigade M.-G. Company: 16 M.-G., 2 Lewis guns.		1 Cavalry Squadron: 150 sabres.
4 Battalions Infantry, 4,000 rifles, 16 M.-G.		1 Cyclist Company: 200 rifles.
1 Field Artillery Battery: 6 guns (4).		1 Field Ambulance.
		1 Brigade Supply Train.
		1 Field Company R.E.

Tactical value, 4,200 rifles, 4 or 6 guns, 32 M.-G., 66 Lewis guns.

A Cavalry Division.

Cavalry Division Headquarters.	|	1 Field Squadron R.E.
4 Cavalry Brigades: 6,000 sabres, 112 M.-G.		1 Signal Squadron R.E.
Cavalry Division H.Q. Artillery.		H.Q. Cavalry Division A.S.C.
2 Horse Artillery Brigades: 36 guns.		4 Cavalry Field Ambulances.

Tactical value, 6,000 sabres, 32 or 36 guns, 88 or 112 M.-G.

An Infantry Division.

Divisional Headquarters.	1 Cavalry Squadron: 150 sabres.
3 Brigades Infantry: 12,000 rifles, 96 M.-G.	1 Cyclist Company: 200 rifles.
1 Pioneer Battalion: 1,000 rifles, 4 M.-G.	Divisional H.Q. Engineers.
Divisional H.Q. Artillery.	3 Field Companies Engineers.
3 Field Artillery Brigades: 48 or 54 guns.	1 Divisional Signal Company.
1 Field Howitzer Brigade: 16 or 18 guns.	1 Motor M.-G. Battery: 6 M.-G.
1 Divisional Ammunition Column.	3 Field Ambulances.
	1 Sanitary Section.
	1 Divisional Train A.S.C.
	1 Mobile Veterinary Section.
	1 Motor Ambulance Workshop.
Tactical value, 13,200 rifles, 64 or 72 guns, 106 M.-G., 214 Lewis guns.	

A Corps.

Corps H. Q.
Corps H. Q. Artillery.
Corps H. Q. Engineers.
3 Infantry Divisions.
Corps Troops.
Fighting value, about 50,000 rifles.

An Army.

Army H. Q.
Army H. Q. Artillery.
Army H. Q. Engineers.
3 Army Corps.
Army Troops.
Fighting value, about 200,000 rifles.

Units allotted as Army and Corps Troops.

Cavalry Regiments and Brigades.	Clearing Hospitals.
Flying Corps Units.	Ambulance Convoys.
Heavy Artillery.	Scientific Laboratories.
Ammunition Parks.	Supply Columns A.S.C.
Pontoon and Bridging Trains.	Transport Units.
Anti-Aircraft Units.	Heavy Workshops.
Labour Units R. E.	Mining Companies R. E.
Labour and Entrenching Batts.	Printing and Topographical Units.

CHAPTER II

COMMAND IN THE FIELD

The Chief Command—Decentralization—Unity of Effort—Subordinate Control—Division of Labour—Lines of Communication Executive—Lines of Communication Defence—Lines of Communication Control and Administration—Military and Naval Co-Operation.

ALTHOUGH armies in the field have now increased to a size that would have staggered the imagination of any of the great military leaders of past ages, and although the scientific side of war has brought into use many weapons of a type hitherto regarded as outside the pale of humanity, there are many of the old principles of warfare that have remained unchanged. The ability to manœuvre is of as much importance as ever, and the necessity of maintaining the mobility of the forward troops remains the same. As in the past, the aim of the Commander is, to out-manœuvre his enemy, to place him at a disadvantage as regards position and by his dispositions compel him to abandon his own plans to counter those of his adversary. The masses which are employed for this purpose must be under efficient control, otherwise they would be of little value; and, what is of greater importance, they must be employed upon definite plans. One of the most important, if not the most important, of the old principles of war which have remained unchanged is that which declares that an army to be successful must operate under the direction of one controlling master mind. This is a maxim which has never been broken, with results which make discussion of the matter possible. On the

contrary, history gives us several excellent examples of a divided policy being employed in operations in the field, and all have met with disaster, except where the error was recognized in time to prevent mishap.

At first glance, it would seem impossible for any one man to control the millions which now represent our field forces; and when one considers the diversity of conditions—take the distance over which the troops will be extended, and the huge mass of material which must be provided—it would seem to be a superhuman task. We are fortunate in being able to say in this case that the impossible has been achieved.

During our discussions on the organization and grouping of the different units, it must have been noted how frequently the term "Headquarters" was employed. In fact, every unit, and every portion of each unit, was stated to be under the control of a Headquarters. Now this fact was especially emphasized because of the close relationship which these Headquarters have with the policy which we have just named, that every part of the force must be under efficient control. The latter part of our previous statement—namely, that there must be but one controlling mind—needs a little more explanation.

The problems of warfare which confront the Commander-in-Chief are different from those which confront the smaller units. The farther back one goes, the broader will be the perspective view of the fight, and the Commander of the whole force will see a number of enemy masses operating like huge pieces on a gigantic chessboard. He does not see the small details, but he does see, from the information which he gathers in many ways, the concentration or distribution of the large bodies of enemy troops. His attention being directed towards them, he devises ways of countering the effect of those movements, and so he manipulates his own masses in accordance with his own plans, seeking to force

his enemy to depart from his original purpose to offset threats here and attacks elsewhere. His view is a broad one, and the pieces with which he plays are large in proportion. To study the problems which present themselves, it is necessary to devote much time and effort to the elucidation of the fragments of information which are constantly arriving, whilst at the same time each development in the situation will have some effect upon his own plans. Under these circumstances, the Commander-in-Chief cannot be harassed by numerous visitors, no matter what their military position may be. To eliminate any danger of this, he deals only with his own staff and the Commanders of the huge masses to which we have already referred—in our forces, the armies.

The armies are the pieces with which the Commander-in-Chief deals, and as they are limited, so the persons approaching him are limited in number.

Now when the Commander-in-Chief has made up his mind upon a certain course, he communicates his instructions to the Army Commanders, telling them as much as he thinks necessary of his plans. To each army would be allotted a special duty, the task being defined from the broad point of view of the Commander-in-Chief. Whether each would be told of the operations of the other would depend upon whether it was advisable or necessary to disclose so much. Where they are to work in unison, each must understand the operations of the other, and must be told accordingly. In this way the Commander-in-Chief is enabled to keep his plans secret, or at least the number of persons who will be acquainted with his purpose will be limited. An advantage gained is, that any explanations which may be necessary may be communicated direct to those who must undertake the duty of putting the plans into effect.

Each Army Commander in turn views the task allotted

to him as a whole, and considers the enemy force in mass confronting him from a little closer view. He probably sees several masses of smaller size than those viewed by the Commander-in-Chief, which have a distribution varying according to the purpose for which they are being used; but having received his own orders, he must put them into actual being, and in doing so he will consider the enemy forces which immediately affect him. He in turn deals with the Corps Commanders, and the same system of communicating instructions is followed as in his own case. The operations are divided amongst the corps, each having its own duties to perform, and each receiving the necessary information to enable them to do so.

The corps divide their duties among the divisions under their command, still passing on the task designed by the Chief Command, and so this process is transmitted down until the small units who perform the task receive their orders.

Such a system would appear to offer disastrous delay, unless one realizes that it is impossible to employ the huge masses of men which make up the armies unless they are deployed over a broad front, supporting arms brought into position behind the Infantry, and by a gradual development the battle brought into one organized effort. Each unit in the chain knows its particular duty, the work of the smaller formations and units being supervised by the man on the spot, who has all the advantages of a knowledge of the ground, situation, and developments. The whole machine is put into action, and each cogwheel fulfils its duty in relation to all the other parts; whilst the hand that sets the engines going is that of the Chief Commander in the Field.

From the review we have made of the system, therefore, we see that one grand plan is first prepared, the operations

are split up amongst the forces, each receives its own task, every link in the chain being overseered by one who is responsible for the particular part, so that the one impulse which actuates the whole force is that which originated in the mind of the Commander-in-Chief.

From this conclusion we see that the organization which we have previously discussed has a definite purpose in regard to the command of the forces, and the series of groups which we have termed "formations" provide successive Commanders with pieces with which they play the game of war.

From what has been said anent the broader views of the higher commands, it must not be supposed that they do not consider the smaller commands at all. On the contrary, they show a deep interest in them, and have an undisputed right to pass opinion upon anything that may concern them; but in operations of war small features of ground, local weather conditions, unexpected resistance from enemy forces, or failure on the part of some one unit or on the part of an enemy unit, may change the whole situation within a few moments. Opportunities may present themselves, or difficulties may occur, which offer advantages or present obstacles which only the man on the spot can be conversant with, and it is therefore better to leave each of the lower commands free to carry out their particular tasks in their own way, making their dispositions according to the local conditions.

It must be remembered that in warfare the soldier in the line only sees what is going on on his own very limited front. When things appear to be bad for him, they may be quite satisfactory in the broader view, because the plan is going forward as intended. If there happened to be no higher command to weigh up the cold facts, a decimated battalion might withdraw, and quite honourably at that,

at a moment when their pressure, although weak, may be the means of pinning a superior force to a position, and offering other more lucky units elsewhere an opening which will turn the tide of battle in our favour. It is inevitable that some units must suffer, and the hardship of the campaign often seems greater because the soldier does not understand where his action has helped the victory forward.

The whole of the facts are briefly summarized in Field Service Regulations, Part II., where it says: "The essence of all efficient organization lies in due subdivision of labour and decentralization of responsibility among subordinates, each individual being given duties which he can perform adequately. At the same time central control and co-ordination of subordinate parts for the attainment of the common objective must be assured."

The Commander-in-Chief is vested with the full control of all personnel, animals, supplies, material, and money in the field, and for their proper employment. He is responsible to His Majesty's Government for his actions. His command is supreme in the field. He prepares the plan of operations, basing his plans on information which has been obtained in time of peace. All of the data which have been gathered by means of the Secret Services, scientific research, and special military councils, are placed at his disposal, so that he goes into the field armed with certain facts, which he considers in their proper relation. He makes his demands for his requirements to His Majesty's Government, and they are responsible for supplying them. Once these demands have been met the responsibility for their proper use devolves upon the Commander-in-Chief.

The extent to which the Commander-in-Chief undertakes the supervision of the maintenance of the force rests with himself. He is provided with machinery to relieve him of

the details, but he has power to make such changes as he considers necessary, for which he must accept responsibility. Usually he leaves this part of the work to his subordinates, but he will personally decide all matters of moment, especially where any proposed steps are likely to affect the efficiency of the force.

The subordinate Commanders are likewise responsible to the Commander-in-Chief, through their next superiors, for the proper employment and maintenance of the force under their command. In the larger formations, the same rules as to the supervision of maintenance apply as in the case of the Commander-in-Chief, although their own conduct of them must conform to the wishes of the Commander-in-Chief.

In order to relieve the higher commands, each subordinate command has certain powers to deal with routine matters, and does so, but wherever there is a question of policy, or one which affects the troops as a whole, involved, then the Commander-in-Chief must decide.

Should a Commander be compelled to give up his command, either temporarily or permanently, without having received orders to the contrary, he will deliver up his command to the next senior, or if this is not possible for any reason, the senior takes the command over automatically, until relieved by superior orders.

Every Commander is assisted by a Staff, which we shall discuss later, and a Commander handing over his command is responsible that he provides the relieving officer with an efficient Staff.

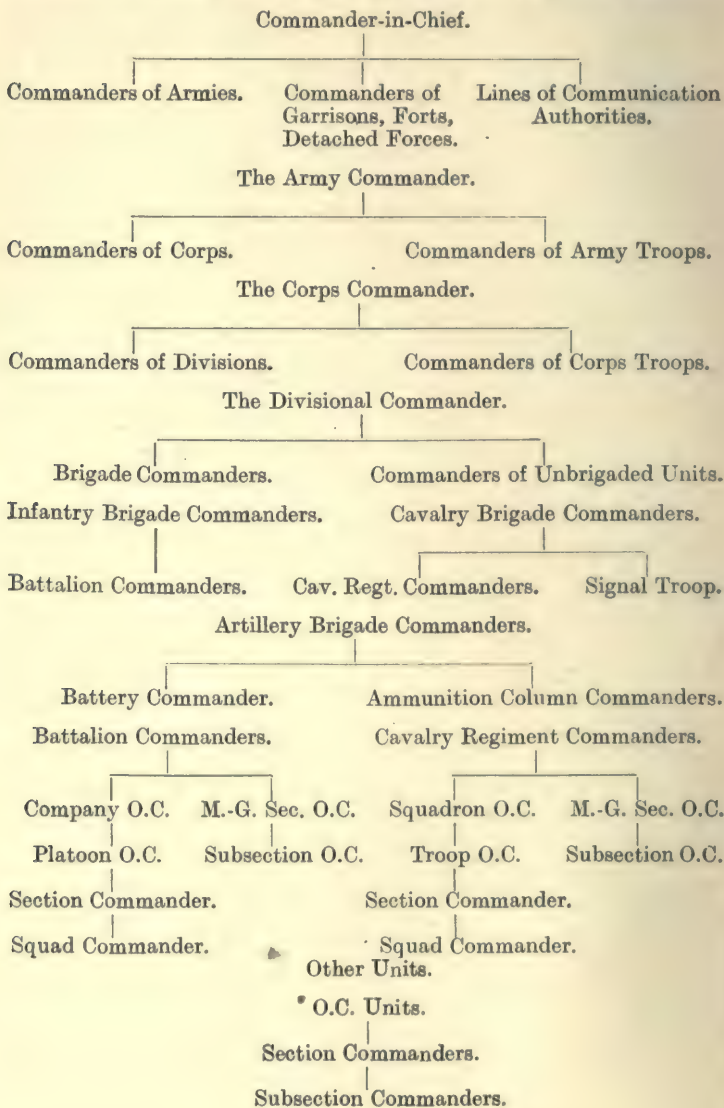
We may sum up the whole question of command, then, as follows:

There is one Commander-in-Chief, who is responsible for the plan of operations, the employment of the troops, maintenance, discipline, and proper use of all material,

etc. He issues his orders through a limited number of subordinate Commanders, who in turn pass them on to the Commanders within their own commands, and these are again passed on through each subordinate headquarters, until finally they reach the private soldier. All of these units having been put into action on the order of the Commander-in-Chief, there is but one objective towards which all efforts are directed. To insure efficient control, each of the headquarters is held responsible for the force which it commands, and as these commands decrease in size as they proceed down the chain of command, they eventually form small parties of troops which can be controlled under all conditions. Each subordinate Commander has power to deal with routine matters within his command, limiting the amount of detail which must reach the supreme command to be attended to. As each Commander deals with a limited number of subordinates, he is able to give personal instructions where necessary, whilst he is given time to prepare his orders and study his plan of action as a result of the limited number with whom he must deal. Where any question of policy or other matter affecting the whole force is concerned, the Commander-in-Chief alone can decide.

We get, therefore, central control, decentralization of command, subdivision of labour, and unity of effort, as the result of our organization, which, supported by the splendid morale of our troops and their undoubted valour, has brought us to the field of victory in so many campaigns throughout the world.

PLATE II.—THE CHAIN OF COMMAND IN THE FIELD.



LINES OF COMMUNICATION EXECUTIVE.

When an army is placed in the field, its safety and success are largely dependent upon the administrative work which goes on behind the advanced troops. It has been stated that the staff work consists of 25 per cent. tactics, and 75 per cent. administration, which is probably correct. The army can only be successful as long as its immediate needs are met promptly. It must be fed, clothed, equipped, supplied with its ammunition, engineer material, etc., otherwise it cannot operate. A rifle without ammunition is of little effect, therefore the administrative services are of vital importance to the force as a whole.

The supply of all the material requirements of an army entails the use of a tremendous amount of transport, etc., and as some of the articles will be more urgent than others it is important that there should be a competent authority to regulate the flow of material, etc., towards the firing-line.

It must also be remembered that the provision of all requirements will have two particular zones of operation. The first will be the concentration and delivery within reasonable distance of the troops, over more or less permanent routes, whilst the second will be the distribution amongst the moving forces in the field area. The first zone is that of the lines of communication, of which we shall have much to say later, whilst the second is that of the field armies.

The lines of communication, being more or less permanent, are placed under a separate Staff for their proper direction and control. The duties are divided into two main parts, each under a separate authority—namely, defence, and administration and control.

The *G.O.C. Lines of Communication Defences* is responsible for the defence of the lines of communication, and also

for the military government of the area through which they pass. To enable him to protect his area, he must be provided with a fighting force (the size will depend on the length and prevailing conditions on the lines). His troops are organized exactly as are the field forces, and grouped into formations, equipped, etc., on a similar basis. His task is a straight tactical one, in which he must make an appreciation of the whole area, and then distribute his strength according to the conditions with which they must cope. His troops must have a certain amount of mobility, although this is not required to the same extent as in the field forces. His transport is not so extensive, since he is always in touch with bases of supply.

In accordance with the requirements of the situation, he will divide his lines into sections and posts, to which he will apportion a part of his troops. In each case he uses complete units or formations, and the officer in charge becomes the Section or Post Commander, as the case may be, and each of these would be responsible through him for the safety of all personnel and material passing over the lines.

He is entirely responsible for defence and protection of the lines, and is answerable directly to the Commander-in-Chief, for which purpose he will be in direct telegraphic communication. He has no control over material, etc., passing over the lines, except when compelled to stop them on account of immediate danger of them falling into enemy hands. Such a step must be gravely considered, as the interruption of traffic may mean loss of a victory, since the material is in transit to the field troops, and possibly the arrival of certain equipment or material may mean a superiority leading to success. Where he is compelled to hold traffic, he must immediately notify the Commander-in-Chief of his action, and also the I.G.C.

Since he is charged with the protection of all traffic, he

must be advised as to its movement, and consequently he must work in the closest co-operation with the I.G.C., who is responsible for meeting the field requirements.

Each subordinate Defence Commander is responsible for his own area, which, unless otherwise defined, extends halfway to the next command, the latter covering the half toward him.

Each Commander of a Section or Post should have a map upon which is shown all tactical distributions within his section, and also of the immediately adjoining units, as well as all traffic points with which he is concerned, such as convoy changing-places, halts, etc.

The division of the lines into sections is studied from the purely tactical viewpoint, and the garrisons are allotted accordingly. All bases will be established as posts with a separate garrison. The size of the sections depends upon the tactical conditions, and they may include one or more posts within the section, in which case the O.C. posts would be responsible to the G.O.C. Defences through their own Section Commander. The Commanders of Sections or Posts may hold a force in reserve as a mobile force, to be used where required, these troops not being detailed to the garrison positions, but held independently under the Commander of the Garrison.

The composition of the garrisons will depend on the duties required of them. Naval bases will be reinforced by permanent artillery positions, for which purpose siege guns may be attached. Protection from aircraft will be provided, and the force built up to meet all possible emergencies. The positions being largely permanent, defences will be constructed, and improved from time to time, in order to reduce the number of troops required to hold them.

In regard to military government of the districts, the Section Commanders and Commanders of the Garrisons

will be the Military Governors of the districts under their charge, and will be responsible for the enforcement of martial law within the commands.

The G.O.C. Defences, and other Officers where the size of the other commands warrants, are provided with a Staff as shown on the accompanying table, whilst the chain of command is as illustrated.

To facilitate administration of the defences, they are usually numbered from the base towards the field, in order to make them easy to distinguish in orders, etc.

The *Inspector-General of Communications* is responsible to the Commander-in-Chief for the administration and control of the lines of communication. The post is a very responsible one, since the duties include the regulation and working of all administrative services and departments on the lines of communication, allotment of buildings for military purposes, concentration of material at suitable places, disposition of all reinforcements, supplies, etc., and transportation of same to the forces in the field, within the limitations defined by the Commander-in-Chief. His duty, therefore, includes the provision of all materials and reinforcements, their concentration, distribution on the lines of communication, and their final despatch to the field forces. The movement of all traffic must be co-ordinated by him in order to meet requirements as desired. He decides the precedence to be given to all traffic, and issues orders by which it will operate. He is also responsible for the provision of all supplies, etc., for the defence forces, and commands all troops, other than defence troops, on the lines of communication. When unable to meet the requirements of the field forces, he must notify the Commander-in-Chief direct, and obtain his orders as to the action to be taken. He reports daily to the Commander-in-Chief as to the condition of the stocks, etc., on the lines.

As in the case of the defence, the lines are divided into sections and posts, usually corresponding to the defence organization. Over each of these sections or posts there is placed an Officer who is known as an Administrative Commandant, and who is the local representative of the I.G.C., to whom all are responsible.

To assist the I.G.C., he has a suitable Staff, and has the Directors or the Deputy-Directors of the Administrative Services and Departments, according to the instructions of the Commander-in-Chief, under his command, the general principle of their distribution being, that where a Director is attached to the Staff of the Commander-in-Chief, the Deputy-Director is attached to the Staff of the I.G.C., and *vice versa*. The representatives of the Administrative Services receive instructions as to the requirements of the field force through the I.G.C., and also as to the distribution, transport, etc.

The *Administrative Commandants* are responsible for similar duties to those of the I.G.C. within their respective commands. They are responsible for the discipline, provision of suitable guards over stores, local picquets, sanitation, interior economy, and policing of the districts within their jurisdiction. The orders of the I.G.C. are transmitted through them to those concerned within their commands. They are in direct communication with the I.G.C., and co-ordinate the work of the various services within the command. They are responsible for the reception of all personnel, material, transport, etc., passing through their commands, but will not delay them unless compelled to do so under very urgent circumstances, when they will immediately inform the I.G.C. of their action.

When receiving stores, etc., they are responsible for the provision of the necessary labour, and will issue orders for their detail. Where sufficient labour cannot otherwise be

obtained, they apply to the Defence Commander for troops for duties, or civil labour may be utilized.

The duties of the various Administrative Commanders will be discussed when dealing with administrative matters, so that we shall not deal with them fully here.

Military Landing Officers, with assistants, are detailed where a naval base is used, and they act under the direct orders of the Administrative Commandant of the base. Their duty is to act as intermediary between the military officials and the Naval Transport Department. The Director of Sea Transport has his assistants, the Naval Transport Officers, at every base, and these officials act in conjunction with the Military Landing Officers in arranging details for docking vessels, loading, unloading, etc. Their duties will be discussed under the heading of "Transportation."

Where the lines of communication are short, the duties of defence and administration may be combined under one Officer, and where there are subsidiary lines, the branches may be combined for defence and administration under one Commandant.

The officials on the lines of communication are supreme in their particular duties, and any officers, however senior, passing over the lines are not allowed to interfere with their operation. The only exception to this rule being when troops are actually engaged, in which case the senior officer on the spot will take command.

We shall later discuss the organization of the lines of communication, showing how they are established, and how they are operated, so that we will not go into the question fully now. It will be sufficient for the present to know that the executive command of the lines of communication is separated from the field force, leaving the Officers there to devote their attention to the operations against the enemy, whilst assured that adequate machinery is employed behind

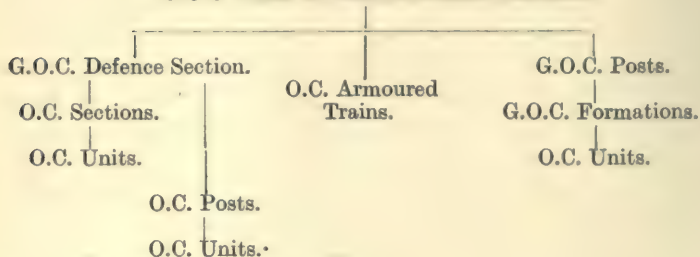
them to provide for their immediate and future needs. The actual lines of communication control is divided into two main parts—defence, and administration and control—each being placed under a separate Commander.

The duties are then decentralized by placing certain Officers in charge of definite sectors, who deal with all local conditions in the name of their superiors. The two heads of the lines of communication departments are both directly answerable to the Commander-in-Chief, from whom they receive their orders, and which they in turn pass on to their subordinates as far as they affect them locally. In the case of administration, the requirements of the field forces are transmitted through this channel, and each local Commandant is responsible that they are promptly forwarded, all arrangements as to provision, transport, etc., being made through them, when they in turn pass on their responsibility to other Commandants when sending through each section.

PLATE III.—CHAIN OF RESPONSIBILITY ON LINES OF COMMUNICATION.

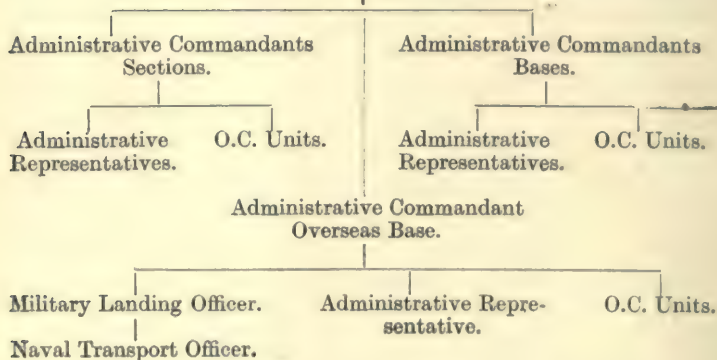
DEFENCE.

G.O.C. Lines of Communication Defences.



ADMINISTRATION.

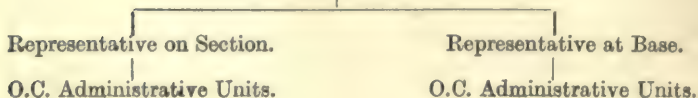
I.G.C.—Directors of Administrative Services or Departments.



LINES OF COMMUNICATION ADMINISTRATIVE SERVICES.

(On technical details only.)

Directors or Deputies.



CHAPTER III

THE STAFF AND THEIR DUTIES

Attached—The Chief Staff Officer—The Division of Duties—Branches—Sections—Subsections—Co-ordination of the Staff Divisions—Interdependence of Parts—Special and Personal Appointments—Grade and Seniority.

IN our previous lecture we discussed the system of command, and brought out the fact that every effort is made to reduce the number of persons with whom the higher Commanders have to deal. We also referred to the need for time to study the campaign, which was of great importance to these Commanders. We shall now proceed to discuss another question touching the same principles—namely, the distribution of labour when dealing with the mass of detail which must necessarily require adjustment in regard to the upkeep and employment of the forces.

In the first place, we must appreciate the fact that the primary duty of our armies in the field is to engage and defeat the enemy, and all other matters must be subordinated to that idea. For that reason, any Staff occupied with the preparation and putting into effect of plans of operation must take precedence of all other branches of the Staff. We must remember that principle throughout our discussion.

Before proceeding to discuss the Staff, we must get an idea of what is meant by a Staff, and why there is such an organization.

The immensity of our armies of to-day makes the feeding,

clothing, payment, medical care, records, etc., matters which necessitate a tremendous amount of care and regulation. There will be a number of details in connection therewith which will require the consent of the higher Commanders. In addition, there will be a large amount of direction required to get all the necessary transport working smoothly towards furthering the plan of operations, and these must all be regulated by the Staff which is conversant with the situation. The Commander who was compelled to attend to all these matters himself would have little time to consider the plans, and consequently it is necessary that he should have a staff of assistants to look after the details and handle them for him. This Staff must have some executive powers, whereby they can take action as required, the only care being that they do not interfere with the operations or change the plans. It is the purpose of the Staff, therefore, to relieve the Commander of a mass of detail. The Officers employed on that work must be efficient soldiers, and have a thorough working knowledge of all arms of the Service. Since their duties demand that they shall take steps to deal with all matters submitted to them, they must be men of judgment and ability. Representing the Commander as they do, they must be men of tact and caution.

In providing a Staff it is necessary to define the duties of every member. Sufficient numbers must be provided to cover all matters, and at the same time there must not be an excess of numbers overlapping each other's duties. Every member of the Staff must have his duties strictly defined for him, and all gaps must be carefully bridged, whilst conflict of authority must be avoided. In order to avoid any possibility of this, the Staff is organized in branches with clearly defined responsibilities, and these branches are again divided into sections, which are again divided into subsections. Each of these portions has set duties allotted

to it, which are detailed along certain definite principles which we shall consider.

The principle of subdivision followed is the same as that considered when organizing the commands—namely, to provide efficient control, reduce the number of persons approaching the Commander, and to subdivide the duties so that no man has more than he can properly perform under all war conditions. To limit the number of persons having access to the Commander, we first organize our Staff into three main branches, a system which operates throughout the forces. When the amount of work to be performed renders the step necessary, these branches are divided into sections, each section being under the control of the branch to which it belongs, and in the same way subsections may be formed under the sections.

It will naturally follow, then, that the higher the formation and the greater the amount of work to be performed, the larger will be the number of Staff Officers required. Similarly, the number of subsections and sections will be reduced as the amount of work decreases. In our discussion, we will take the higher commands first, note the distribution there, and later we shall see how the Staff is reduced in the smaller formations.

As we have already stated, the Staff is divided into three branches, the names of which operate in all units. They are those of the General Staff, the Adjutant-General, and the Quartermaster-General. These three main divisions are referred to as "branches." Each has special duties, and in order to present the general distribution first, we will summarize them, and take them in detail after.

The *General Staff* is responsible for the actual fighting details, and those which are closely allied to it. They may be briefly stated as: All operations, intelligence duties, inter-communication, military policy.

The *Adjutant-General* is responsible for all matters of discipline, law, record, supply of personnel, medical service, interior economy.

The *Quartermaster-General* for all matters of supply, ordnance, transportation, permanent works, provision of material requirements, postal and veterinary services.

In order to co-ordinate the work of the three branches, there is an Officer placed in command of the whole Staff, who is known as the Chief of Staff, or Chief Staff Officer. Where no such appointment is authorized, the senior Officer of the General Staff branch performs the duties.

The *Chief of Staff* is responsible for the co-ordination of the work of all branches, for supervision of their work, and also acts as the chief adviser of the Commander of the force. Naturally his position is one of great importance, and he must be a very clever soldier. He is not responsible for the interior working of the branches, but deals with them as a whole, working with the senior Officer of each branch direct. Since he is to be the chief adviser of the Commander, he must be fully cognizant of everything that transpires, and consequently he should always be present when any matter is being discussed by the Commander and the Officer in charge of a branch. He signs all operation orders in the name of the Commander.

A glance at the summary of duties which we have given will make it evident at once that many of these duties will bear a close relation to others in another branch. As an illustration let us take the question of a concentration of troops at a certain point; the first question is one of tactics or operations, whilst the problem of transportation immediately comes into effect. The General Staff and Quartermaster-General branches must therefore work in unison. This is the case in all branches, the primary reason for a step being found in the plans of the General Staff branch;

the other branches being affected thereby they must consult with that branch before making their dispositions. The necessity of the closest co-operation between all three branches is, therefore, at once apparent. Each branch can only be looked upon as a wheel in the machine, and is useless unless its movement coincides with the other parts of the machine. There is no place in the army where smooth working is more necessary than in the Staff. If friction exists there, it must be felt throughout the force, since its results will be felt in every order which emanates from that body. We must learn, therefore, to look upon the Staff as a whole, and only to regard the three branches and their subdivisions as interior parts having special purposes.

The three branches are each placed under an Officer, who has complete charge of all those employed within the sections or subsections within the branch. He supervises their work, passes all matters to the proper Officers, or receives their reports for transmission to the Commander. Every Officer in a Staff is responsible for taking the necessary steps to advise any other section or branch of any matter affecting them. All correspondence, etc., is the common property of the Staff as a whole, and access may be had to them at any time, so that no difficulty of co-operation should exist, the whole principle being governed by the fact that the Staff is *one* machine dependent upon the working of the different parts for its successful operation.

The Chief of Staff and the three heads of branches are the only Officers having direct access to the Commander in all discussions, thus limiting the number approaching him to four, besides the subordinate Commanders. An exception is, of course, made where the necessity of obtaining signatures, etc., may arise, but in the larger issues these Officers alone approach the Commander, and it is through them that he issues his orders to the Staff. Whenever any one

of them sees the Commander, the Chief of Staff should be present, or should be advised at the first opportunity of what was done, in order that he fully realizes all circumstances with any matter which he may later be called upon to deal.

Having briefly touched upon the general principles of Staff organization, we are now ready to discuss in detail the duties of the different branches. We will take the senior branch first.

THE GENERAL STAFF BRANCH.

This branch is the senior one, and is particularly responsible for advising the other branches at the first opportunity of possible future requirements in which they are interested. The duties as laid down in the Field Service Regulations are as follows:

Operations.—All military operations, including the general control, in co-operation with the Navy, of embarkation and landings within the theatre of operations. War organization and efficiency of the troops. Selection of lines of operations. All plans for the concentration, distribution, and movement of troops and material by rail, road, or inland waterways in the theatre of operations. The general allotment of areas in which Divisions and Brigades are to be quartered. Security, marches, and battle.

Intercommunication.—Intercommunication in the field.

Intelligence.—Special reconnaissances. Provision of guides and interpreters. Acquisition and distribution of information about the enemy, the country, and its resources. Flags of truce and correspondence with the enemy. Censorship over communications—*i.e.*, the post, telegraphs, telephones, and cables. Control of the press and press correspondents. Secret Services, cyphers, care and disposal of captured documents. Provision and distribution of maps.

Military Policy.—Questions of policy in connection with international and martial law, including in the case of martial law advice as to the necessity for and scope of its enforcement. Policy connected with raising new units. Charge of foreign attachés. Preparation of reports, despatches, and diaries relating to the above.

From this list we see that all dispositions of the troops from the tactical point of view come within the duties of this branch. Moves, quarters (as far as distribution is concerned), protection, and concentration are their concern. Information from all sources comes in to this branch, and as information must be promptly delivered if it is to be of any value, the signal services come into the same branch, insuring greatest speed in delivery. Questions of policy, being closely affiliated to the operations in hand, are also decided in this branch.

In the preparation of plans of operation the first thing to be considered is the dispositions of the enemy, his strength, and all that is known about him. The Intelligence section provide that. The next consideration is information regarding the country, its topography, lines of advance, roads, etc., which comes from the same section. Later revised maps of the field of operations are necessary, which are also provided from the same branch. Special reconnaissance may be carried out, either by the reconnoitring cavalry, aeroplanes, or by specially detailed agents or troops. These operate under the Intelligence section. Having obtained this information, the plans are drawn up as far as the tactical distribution goes, the troops allotted their tasks, and the different movements agreed upon. As we shall see later, the other branches must be considered, and their matters adjusted before the final dispositions are issued.

Questions of policy are decided by the Commander-in-Chief in consultation with this branch. Matters affecting

International Law must be carefully considered. The policy adopted towards the civil population has a material effect upon the campaign. Drastic measures may be adopted in one place, more conciliatory measures elsewhere, according to the temperament, hostility, etc., of the people concerned. In the larger formations the branch may be divided into sections as follows:

Operations.—This section should work out time-tables of movement, distances from objectives, etc., preparing the data to be considered when completing the plans.

Intelligence.—This section should be subdivided into subsections, dealing with different matters, as follows: Secret Services, dealings with agents, censorship of mail, telegrams, telephones, press, etc., from which much information would be gathered. Reconnaissance; dealing with all field messages. Topography, developing maps as information is received, using aerial photographs, field sketches, etc., and issuing revised maps as they are improved.

Each section has its own Officers, who report to the Officer in charge of the branch.

We will now turn to the next branch, and later we will connect up the three branches, placing each in its proper relation to the Staff as a whole.

THE ADJUTANT-GENERAL BRANCH.

This branch is responsible for—

Discipline.—Police measures, military regulations.

Law.—Military law, administration of martial law, and compilation of regulations relating thereto.

Record.—Questions relating to personal services, pay, promotion, enlistments.

Supply of Personnel.—Questions relating to the supply of personnel to the army, disposal of prisoners of war, mobilization of improvised units.

Medical Service.—Sanitation, provision of medical equipment, casualties, and invaliding.

Interior Economy.—Questions relating to honours and rewards, interior economy, applications of all kinds concerning the fighting troops, spiritual welfare of the army burying parties and places, routine garrison and camp duties, ceremonial, preparation of reports, despatches, and diaries relative to the above.

These are the duties laid down in Field Service Regulations, Part II., and when summarized deal particularly with the welfare of the troops, individually and collectively. Enlistments, punishments, records, pay, promotions, honours and rewards, care when sick, spiritual care, burial, all come within the purview of this branch. Apart from individual considerations, we find that discipline, regulation, routine duties, ceremonial, and other collective duties apart from those of actual fighting, is the special province of the branch. The Medical Service, affecting as it does the matters of record, invaliding, fighting strength, etc., of the troops, is supervised by this branch in order to get the closest co-operation in those matters which are closely allied. The subdivision into sections which may be adopted would give us a distribution somewhat as follows:

Law and Discipline.—A section responsible for deciding the legal aspect of all trials, military or martial, construction of the necessary laws, and advice as to their application. Revision of all documents in regard to trials, records of same, and the proper care of those undergoing punishment.

Record.—A section dealing with all statistics of strength of the forces, removal of casualties, collection of casualty reports, reports on individuals and units, preparation of diaries, etc. Where the amount of work justified the step, a separate subsection might be created to deal with Officers only.

Interior Economy.—A section dealing with all routine matters, duties, guards, escorts, etc.

The number of sections will depend on the amount of work to be distributed, and it is sufficient for us to know the principles which we have previously discussed.

This branch may be roughly described as the clerical office wherein the interests of the individual and the force collectively are recorded and governed.

THE QUARTERMASTER-GENERAL BRANCH.

This branch is responsible for the following matters: Embarkation and landings within, and if necessary outside, the theatre of operations, subject in the former case to the general control of the General Staff branch. Distribution in detail of quarters and buildings within the areas delineated by the General Staff. Questions concerning supplies, ammunition, equipment (medical excepted), clothing and stores of all kinds, land and sea transport, railway administration, remounts, veterinary service, postal service, rendering proper accounts for expenditure of an abnormal character, preparation of reports, despatches, and diaries relative to the above.

This branch, as will be seen, is largely responsible for bringing supplies of all kinds within touch of the field forces, and for their distribution. It is to the material interests of the troops that this branch devotes its attention. In a very large command the duties will be distributed in sections as shown above. It will be noticed here that the embarkations, quartering, movement, and transport of troops are given, but "in detail." Our previous illustration of the dual responsibility of the General Staff and this branch serves to make the apparent paradox clear. The one looks at the matter from the tactical viewpoint, whilst the other is charged with the administrative detail of the operation.

The three branches having been studied a little more closely, we now see that the duties are clearly regulated, and at once notice that the General Staff is a directing body, devoting its attention to the conflict and matters closely related thereto, whilst the other two branches deal with administrative work. That they are all involved in every operation is evident. The General Staff, by the plans they prepare, devise the sequence of steps to be taken, and the others prepare their respective details to assist in putting them into effect. In an attack the plans are drawn up, the A.G. makes his arrangements for the evacuation of casualties, reception of prisoners, record of losses and captures, etc., whilst the Quartermaster-General must arrange for the food, ammunition, remounts, and veterinary services, and also for the transportation of these commodities to the firing-line. Each makes out his own draft for orders, the whole being embodied in one operation order. These orders will be reviewed by the Chief of Staff, who is responsible that all matters are provided for, and who finally signs and issues the orders to those concerned. Now we must clearly grasp the important fact that each Officer in the Staff must prepare his own part of the work, and as soon as the rough outlines of the operation have been defined, each proceeds to his task. The Commanders of the various branches assemble the results of their Section Commanders' work, and present the whole for inclusion in orders. The Chief of Staff sees that the parts all fit together and are complete, and then issues the orders. There is no separation of the distinctive features, but a gradual building-up process into one solid and complete whole.

There will naturally be many purely administrative matters which form part of the routine of the army, and which do not involve questions of tactics, and therefore do not immediately concern the General Staff branch; and as

that branch will be busily occupied in the study of the campaign, and possibilities of a strategic or tactical nature, it would be useless to worry them with detail. Such matters as the replacement of worn clothing, promotions, increases of pay, convening of courts martial, etc., which have no bearing on the campaign proper, have no place in the clear, concise instructions which the order for battle must present. In order to make it possible to keep these details separate, both as regards labour and notification, separate orders are issued by the administrative branches. Thus the orders of the Adjutant-General's and Quartermaster-General's branches are issued as "routine orders." These orders are published daily at a fixed hour. At the stated time representatives of the next formations or units in the chain report at Headquarters and receive their orders. This occasion affords an opportunity of discussing routine matters, when information may be given or received. At the same time the standard time is given out, and watches corrected accordingly. These routine orders are signed by the senior Officer of the two branches, and by their means authority is given for any change of existing regulations, if authorized by the Commander of the Force.

Having discussed the Staff as a whole, and formed a general idea of its organization and duties, we may well spare a few moments to discuss the Staff Officer as an individual.

In the first place, the Staff Officer is a Regimental Officer specially employed on the Staff. He is nothing more as far as rank, seniority, or standing is concerned. He holds a position of great responsibility, but, like every other soldier, he is dependent on his master's will for his authority. When he speaks, he does not do so as an individual, but speaks in the name of, and on behalf of, his Commander. His opinions have no weight unless they are also the opinions

of his chief. His power to act is regulated by the instructions which he has himself received. The extent to which he can use his own initiative must be definitely stated by his Commander, and when once that power has been given, it can be neither extended nor varied without his consent. What he does, therefore, is what his Chief desires to be done. Now for this reason it is very necessary that the Officer selected for Staff duty should be fully qualified. It is not sufficient that he understands the duties of his own arm, he must also understand the organization, power, and duties of other arms with whom he comes into contact. As an individual, he must be tactful, energetic, and loyal. He is not merely an agent who carries certain orders for another, he must be something more. He must be the visible presence of his Commander. He must be ever ready to help, advise, or otherwise assist in putting his Commander's orders into effect, and where he has been given certain definite duties to perform he must not only prepare the orders for those duties, but is responsible for seeing that they are obeyed. He has only one purpose in the army, and that is to procure the maximum results in accordance with the instructions he receives. He must overcome, and where possible foresee, obstacles, and when compelled to acknowledge some task as impossible, he must be certain that other methods are not foreign to the intention of his chief. If they are, he must consult him and get his instructions. This is the position of the Staff Officer, and all others must recognize that position, and when receiving orders from a Staff Officer, they must accept them in the spirit in which they are given—namely, that they are the orders of the Commander. In order to enable the Regimental Officer to identify the Staff, special dress distinctions are worn by those employed on the Staff. Attached Officers are not privileged to wear these distinctive badges.

We have discussed the Staff Officers who are members of the three branches, but there are several appointments to the Staff which carry certain duties with them. They are classified as either personal or special appointments. They are as follows:

SPECIAL APPOINTMENTS.

Director of Sea Transport.—This Officer is a member of His Majesty's Naval Forces, and acts on behalf of the Admiralty in regard to all arrangements for the use of sea transport. He receives advice as to possible requirements, and co-ordinates the details between the military and naval commands. We shall discuss his duties more fully later.

Provost-Marshal.—This Officer is responsible for the Military Police organization, their employment, efficiency, etc., and is the medium through which the instructions of the Adjutant-General are put into effect. In smaller commands there are Assistant Provost-Marschals.

Camp Commandant.—This Officer (or where no such appointment is authorized, an Officer holding a personal appointment) is responsible for the immediate safety of a Commander and his Headquarters. He looks after the administrative work in regard to the Headquarters Staff and Substaff.

Financial Adviser.—This official is only appointed when occasion demands there shall be some financial expert to advise in regard to purchases, expenditures, accounting, etc. He is usually a man having experience in all economic matters, and an expert in money affairs. He acts in an advisory capacity, and, if appointed, supervises the checking of all expenditure and the proper accounting of same.

PERSONAL APPOINTMENTS.

Military Secretaries.—These officers act as the confidential secretaries of the higher Commanders, recording their private

affairs and all matters of a highly confidential or secret nature. They assist the Commander to prepare his despatches and reports, and provide him with his personal clerical staff.

Aides-de-Camp and Orderly Officers.—These Officers act as the personal attendants of the Commander. Their duties are more particularly directed towards arranging his personal details, looking after his comfort, etc. They are employed as his messengers as occasion demands, and usually accompany him wherever he goes.

GRADING OF STAFF OFFICERS.

Staff Officers are graded for the purposes of pay by a certain standard, and they bear a title according to the duties they perform. The question of rank does not affect their appointment, and they draw pay according to the grade which they hold.

General Staff Officers, employed in that branch, are graded as General Staff Officers 1, 2, or 3, their pay being again fixed according to the formation to which they belong. A G.S.O.1 will draw more pay when employed on an army than when employed on a division, the responsibility being proportionately heavier. The Adjutant-General's and Quartermaster-General's Staffs are graded according to appointment. Their appointments carry a distinctive name indicating their grade. At the head of the branch we have the Adjutant-General or Quartermaster-General, and the lower grades follow a regular precedence. They are as follows:

Adjutant-General.	Quartermaster-General.
Deputy Adjutant-General.	Deputy Quartermaster-General.
Assistant Adjutant-General.	Assistant Quartermaster-General.
Deputy Assistant Adjutant-General.	Deputy Assistant Quartermaster-General.

The letters only are used to designate their appointments in all military documents or correspondence, as A.G., D.A.G., A.A.G., D.A.A.G. Sometimes the two branches are combined under one Officer, when he will use the dual title, as, "Assistant Adjutant- and Quartermaster-General," or whatever his grade may be. The letters used in this case may be confusing, but the use of the word "and" indicates that the two branches are represented—*i.e.*, A.A. and Q.M.G.

This system also applies to the directorates of the Administrative Services, with whom we shall deal later.

We can now summarize our conclusions on the general principles governing the General Staffs, their duties and organization.

Every General Officer exercising a command has a Staff, and all Staffs are organized along certain definite principles. The size of the Staff is governed by the work to be performed. No matter how large that Staff may be, it has the same system of organization. A Chief Staff Officer supervises the work of the whole. The Staff is organized in three branches, each being under a responsible Officer. The work inside the branches may be distributed into a number of sections, but in each case the duties are strictly defined, and someone is made responsible for their performance. The sections report through their branch Commanders, through whom they receive their instructions. These Commanders are the immediate advisers with the Commander, limiting the number of persons approaching that Officer to four. The three branches are intimately connected in their work, and the closest co-operation must exist between them. Each branch considers all operations with special regard to its own particular sphere of duties, prepares its orders, and submits them for embodiment in the completed order of the Commander, the Chief of Staff being responsible that they are complete when issued. The duties of the

Staff Officers do not end with the preparation of the orders, but extend to their actual accomplishment. The Staff Officers sink their personalities in that of their Commander, for whom they act, think, and speak.

The duties of the different branches being systematically arranged, the same organization is found throughout the Service, therefore any subordinate Commander knows to whom he must apply in regard to any particular matter. The larger the organization, the larger the Staff will be, and *vice versa*. Whatever its size, the system remains the same.

By means of the Staff we have a machinery which exercises on behalf of the Commander a general supervision over every subject, the work being distributed according to the capability of any man to perform same. Overlapping is avoided by specifying the responsibilities of each individual, and gaps are prevented by the same general allotment of duties. Finally, confusion is avoided by making certain branches responsible for particular subjects, the premier branch always being that which governs the operations of the troops in regard to the enemy, the other branches subordinating their plans to this, the primary object in placing an army in the field.

The Staff provides the Commander with his personal assistants, and the subordinate Officers in the command with officials whom they can consult on matters not requiring the opinion of the Commander personally, the number of persons approaching the Commander and the amount of detail submitted to him being reduced by this organization.

To distinguish the Staff from other Officers, certain badges of distinction are worn, which are defined in the following pages.

We shall now commence to deal with the various Headquarters and their strengths, after which we shall discuss

the method by which the Staff is advised in technical matters upon which they cannot be expected to be fully instructed.

DISTINCTIVE DRESS OF STAFF OFFICERS.

Staff Officers wear dress of a distinctive pattern to assist in identification in the field. They wear the forage cap instead of service cap, the top being covered with khaki material to leave the band showing. Field Officers wear a gold-embroidered peak. Badges of rank are worn on the shoulder-strap or on the cuff, as for Regimental Officers. Staff gorgets are worn on the collar of the coat, the colour corresponding to that on the cap-band. Officers holding command of formations wear a strip of gold braid laid on the gorget, whilst those holding Staff appointments wear a line of gimp, in both cases with a regimental or departmental button.

Officers employed under a Staff are not permitted to wear the Staff badges.

The following Officers with a field force wear crimson cap-bands and gorgets, the gimp being of similar colour: General Staff Officers of all grades, Appointments in Adjutant-General's branch, Appointments in Quartermaster-General's branch, Brigade-Majors, Staff Captains, Military Attachés, Military Secretaries, Aides-de-Camp, Orderly Officers, Colonels commanding Brigades.

The following Officers wear blue cloth cap-bands of special shade and similar gorgets, the line of gimp being in red: Chief Engineers; Staff Officers R.E.; Assistant to Chief Engineer; Directors or lesser grades of Directors of the following services and departments: Supplies, Transport, Ordnance, Medical, Veterinary, Remounts, Signals, Postal Services, Railway Transport, Railway Construction, Inland

Water Transport, Requisition and Stationery; Administrative Commandants of Bases, and Base Depots on the Lines of Communication; Chief Ordnance Officer, Chief Paymaster, Command Paymasters, Deputy Judge-Advocate-General, Provost-Marshal, Garrison Adjutants, Camp Quartermasters, Embarkation Staff Officers, Railway Transport Officers, Military Landing Officers, Train Conducting Officers, Sanitary Officers.

Green cap-bands and gorgets with lighter green gimp are worn by Staff Officers specially employed at home in regard to Musketry, Gymnasia, Recruiting, and Catering, and on the home Intelligence Department.

Principal Chaplains wear black cap-bands, gorgets, and shoulder-straps.

CHAPTER IV

DISTRIBUTION OF STAFF

Attached—Substaff—Artillery Headquarters—Engineer Headquarters
—Administrative Representatives—Relation of—Distribution of
Administrative Representatives to Branches.

THE Staff allotted to the various commands is set out on the accompanying table. It will be seen that the number of regular Officers of the Staff is greater in the higher formations than in the lower ones. Apart from the members of the Staff, there are a number of Officers who are "attached." These Officers are not entitled to wear the distinctive badges, and the number varies according to the work to be performed. As in the case of the Staff, their duties must be defined, and they will be attached to a section and report through the usual channels.

In addition to the Staff, there will be a Substaff of other ranks to perform the clerical duties, messenger services, grooms, cooks, batmen, drivers, etc., and there will also be a proportion of transport to carry the effects of the Headquarters. On the divisional and higher commands, an electric lighting equipment is carried to provide the necessary light for night-work. The numbers of the Substaff do not play an important part in our considerations, therefore we shall not bother with them so long as the fact of their existence is known.

The Staff of the Commander-in-Chief is divided into three echelons. The first comprises the Staff proper, with their

accompanying Substaff; whilst the second echelon consists of the administrative attached Officers, military police, farriers, cooks, orderlies, batmen, etc., under the Camp Commandant. The third echelon is situated at the base, and as this is an important branch, we shall discuss this in detail.

The *Deputy Adjutant-General* has charge of the third echelon, and has his office at the base. His office is vested with certain duties, and one might call it the clearing-house of the Field Staff. We shall have occasion to refer to the duties there again and again but we will summarize them here, in order to fully appreciate the connection with Headquarters in the field.

The Deputy Adjutant-General is responsible for—

1. Notification to the military authorities concerned of the prospective or immediate requirements of the forces in the field as regards personnel.

2. Compilation of returns as regards personnel.

3. Verification and communication to the military authorities concerned of the casualties in the field (including officers and civilians authorized to be with, or enrolled in, the forces in the field).

4. Notification to the military authorities concerned of requirements in the way of Officers for improvised cadres and appointments.

5. Personal services, postings, transfers, promotions, of N.C.O.'s above the rank of sergeant; provisional promotion of Officers; personal effects of the enemy's dead; supply to the War Office (or military authorities concerned) of the necessary information required by the Hague and Geneva Conventions as regards prisoners of war and the enemy's dead.

6. Opinions and remarks on all cases which may be referred regarding military and martial law, discipline,

confidential reports, resignations and retirements, custody of court martial.

7. Custody and transmission of war diaries and other documents of an historical nature, and custody of regimental documents.

It will be noticed that these duties correspond with the duties of the Adjutant-General in the field, seeing that all routine matter, records, and changes in records, are entrusted to this branch.

The Staff for the third echelon is given on a separate sheet, showing the Line of Communication Staffs.

Every unit going to the field leaves a representative at the base, who is attached to the office of the Deputy Adjutant-General, and who looks after the interests of that unit under the direction of the Deputy Adjutant-General. The office of the Deputy Adjutant-General is the medium through which all routine correspondence with the War Office is passed, the whole object of the branch being to take the responsibility off the Staff in the field.

The composition of the Staffs below that of the General Headquarters down to the Division merely varies in numbers, but in the Brigade we find a departure from the regular formation. Here the amount of work to be done is limited, and consequently there is no need of a large Staff. To avoid changes in the system, we combine the duties in the Adjutant and Quartermaster-General's branches. The Brigade-Major acts as the Chief of Staff, and does all the work of the General Staff branch, whilst the Staff Captain performs all the duties of the other two branches. In the case of the latter, his duties are largely concerned with correspondence relating to many of the matters which pass to divisional units for attention. For instance, supplies are handled by the divisional Train, and the divisional Staff issue orders to them. Similarly the questions in regard to pay, clothing,

medical services, transport, remounts, etc., are all matters affecting divisional units, and consequently outside the jurisdiction of the Brigade Staff, although within the matters with which they will be constantly concerned. For this reason the Staff Captain can quite easily attend to the work of the two branches.

It might not be out of place to call attention to the similarity which exists between the Staff of the units and the formations. In a unit we have a Commander, whose Staff consists of a Second-in-Command, who acts as his Chief of Staff, and assists in the preparation of all operations. The Adjutant corresponds to the Adjutant-General of the Staff, whilst the Quartermaster performs the duties of the Quartermaster-General, the organization being almost identical.

Technical Headquarters are attached to the Staff in order to provide efficient advice in matters which could not be expected to be within the ordinary knowledge of the Staff Officers. They are there as technical advisers, and are also the medium through which technical instructions are transmitted to the technical units. They receive at first hand the instructions of the Commander, and then put them into the required technical order.

The *Headquarters of Artillery* is therefore concerned with all matters concerning Artillery units. They advise in regard to the employment of the guns, selection of gun positions, rate of fire, and effect. They also superintend the issue of ammunition through the ammunition columns, obeying the direction of the Quartermaster-General in regard to movements, or the Adjutant-General in regard to traffic control. They advise the Commander as to the capabilities of the guns, and issue the orders for their employment in accordance with his plans.

The *Headquarters of Engineers* act in a similar capacity in

the interests of the Engineer services. They prepare plans in accordance with the wishes of the Commander, advise as to work necessary, and superintend the carrying out of the work by the Engineer units.

By these two technical Headquarters, the Commander is provided with competent advisers in strictly technical matters in relation to the fighting forces; but in the administrative work there is equally a need for technical advisers, which is provided by attaching representatives of the administrative services and departments to the Staff. They follow a similar procedure to the above, advising where necessary and superintending their own branch of the work within the force. We shall later deal with these services in detail, so that it will be sufficient for now to enumerate the various representatives and the branches of the Staff with whom they deal.

The heads of the services are described as Directors, and the different lower grades as Deputy Directors, Assistant Directors, and Deputy Assistant Directors, similarly to the Staff of the two administrative branches. As in their case, the question of pay is all that is affected by the grade. On the lower formations the grade is, of course, lower. Where the appointment of a representative is not authorized, the senior Officer in charge of a unit of that service with the formation acts in his stead.

The General Staff branch deals with the Director of Signals, and Medical Services, the latter only in regard to the tactical distribution of the medical units.

The Adjutant-General branch deals with the Director of Medical Services, the Deputy Judge-Advocate-General, and the Chaplains' Department, whilst the Provost-Marshal is under this branch.

The Quartermaster-General deals with the Directors of Supplies, Ordnance Services, Transport, Railway Transport,

Works, Remounts, Veterinary Services, Paymaster-in-Chief's Office, and the Postal Service.

It will be seen, therefore, that in all matters which are of a technical nature competent advice is available when required, whilst the presence of these officials enables the Staff to issue any special orders at once to the services concerned.

These representatives have a dual responsibility. In the first place, they are responsible to their immediate Commander for the proper administration of all matters relating to their services within the formation, whilst they are responsible in all technical matters to the head of their own services or departments. In all matters immediately affecting the force with which they are attached they deal through the Commander, but in matters of a strictly technical nature, not requiring his decision, they deal with the next senior Officer of their service. Thus they may deal with the representative on the next higher formation, who will either give a decision on the matter or pass it on to the next higher authority until it reaches the Director of the service on the Staff of the Commander-in-Chief.

We may now add to our former summary, then, the fact that to each branch of the Staff there are attached representatives of the various technical services and departments, who advise in regard to matters which affect their particular work, and who superintend, under the direction of the Staff, the employment of their units within the command. Headquarters of the Engineers and the Artillery are attached to the Headquarters to supervise their particular branches of the work.

As we progress in our studies we shall constantly refer to the relationship of these two Staffs, and their actual working will disclose itself when considering the work of each particular service or department.

In our future lectures we shall use the abbreviations for

the various parts of the Staff, and as they are in general use in the Army, it is well to remember them. They are as follows:

Chief Staff Officer	..	..	..	C.S.O.
General Staff Branch	..	..	..	" G " Branch.
Adjutant-General Branch	..	..	..	" A " Branch.
Quartermaster-General Branch	..	..	..	" Q " Branch.

The abbreviations as given in the list of abbreviations at the commencement of the Field Service Pocket Book will be used, and should be studied, since they are always used in actual military practice.

PLATE IV.—CHART SHOWING DISTRIBUTION AND CHAIN OF RESPONSIBILITY IN A FIELD STAFF.

THE COMMANDER.

A.D.C. or Orderly Officer.
Camp Commandant.

G.O.C. formations (armies, corps, divisions, or brigades), O.C. unattached troops (army, corps, divisional units).

C.S.O., Adviser to G.O.C., co-ordination of Staff work.

GENERAL STAFF. ADJUTANT-GENERAL. QUARTERMASTER-GENERAL.

G.S.O. 1.
G.S.O. 2.
G.S.O. 3.

D.A. and Q.M.G. or
A.A. and Q.M.G.

Operations.
Intelligence.
Intercommuni-
cation.
Military policy.

A.A.G. or
D.A.A.G.
Law.
Discipline.
Duties.
Interior Economy.
Medical Service.
Sanitation.
Records.

A.Q.M.G.
D.A.Q.M.G.
Supplies.
Ordnance.
Transport.
Works.
Remounts.
Veterinary services.
Postal services.

H.Q. artillery
and Engineers.

ATTACHED
Provost-Marshal.
Chaplain.
Judge-Advocate.

For each service either a
Director, Deputy Director,
Assistant Director, or
Deputy Assistant Director

MEDICAL.
D.M.S. or
D.D.M.S. or
A.D.M.S. or
D.A.D.M.S.

MEDICAL.
D.M.S. or
D.D.M.S. or
A.D.M.S. or
D.A.D.M.S.

Supplies.
Ordnance services.
Transport.
Railway transport.
Works, Remounts.
Veterinary service.
Postal services and
Paymaster.

SIGNAL.
D. Sigs. or
D.D. Sigs. or
A.D. Sigs. or
D.A.D. Sigs. or
O.C. Signal Coy.

Topographical Section R.E.

Orderlies, clerks, messengers, police, cooks, batmen, drivers, transport, postal section, farriers, veterinary section, etc.

Note.—The above chart illustrates the chain of communication, but the three heads of branches may communicate with the Commander direct in presence of the C.S.O.

The Staff will communicate with G.O.C. formations or units in routine matters, or to convey the orders of the Commander.

In the smaller formations, the C.S.O. will be at the head of the General Staff branch and will perform both duties.

ESTABLISHMENT OF FIELD STAFFS.

<i>Appointments.</i>	<i>General H.Q.</i>	<i>Army H.Q.</i>	<i>Corps H.Q.</i>	<i>Cavalry Division H.Q.</i>	<i>Infantry Division H.Q.</i>	<i>Cavalry Brigade H.Q.</i>	<i>Infantry Brigade H.Q.</i>
<i>Commanding.</i>							
Field-Marshal ..	1						
General ..							
Lieut.-General ..		1	1				
Major-General ..				1	1		
Brigadier-General						1	1
<i>Chief of Staff.</i>							
Lieut.-General ..	1						
Major-General ..		1					
Brigadier-General	2		1				
<i>General Staff.</i>							
G.S.O. 1 ..	2	1		1	1		
G.S.O. 2 ..	4	1	1	1	1		
G.S.O. 3 ..	5	2	2	1	1		
<i>Joint Control.</i>							
D.A. and Q.M.G.		1	1				
A.A. and Q.M.G.					1		
D.A.A. and Q.M.G.			1	1	1		
<i>A.G. Branch.</i>							
A.G. ..	1						
D.A.G. ..							
A.A.G. ..	1	1					
D.A.A.G. ..	2	1					
<i>Q.M.G. Branch.</i>							
Q.M.G. ..	1						
D.Q.M.G. ..							
A.Q.M.G. ..	1	1	1				
D.A.Q.M.G. ..	1	1		1	1		
<i>Brigade Staff.</i>							
Brigade Major ..						1	1
Staff Captain ..							
<i>Personal Appoint- ments.</i>							
Camp Command't	1	1	1				
Provost-Marshal	1	1		1			
A.P.M. ..		1	1		1		

ESTABLISHMENT OF FIELD STAFFS—Continued.

<i>Appointments.</i>	<i>General H.Q.</i>	<i>Army H.Q.</i>	<i>Corps H.Q.</i>	<i>Cavalry Division H.Q.</i>	<i>Infantry Division H.Q.</i>	<i>Cavalry Brigade H.Q.</i>	<i>Infantry Brigade H.Q.</i>
<i>Attached Royal Artillery H.Q.</i>							
Major-General ..	1	1					
Brigadier-General			1		1		
Colonel				1			
Brigade-Major ..					1		
Staff Captain ..		1		1	1		
<i>R.E. H.Q.</i>							
Brigadier-General	1	1	1				
Colonel					1		
Chief Engineer ..			1				
Field Engineer ..			1				
Assistant Engineer			3		1		

In addition to the above Staff Officers, a few Officers are attached for special duties, but are not graded as Staff Officers.

Each Staff has a proportion of other ranks as subordinate Staff, which includes draughtsmen, clerks, registry clerks, police, grooms, batmen, cooks, drivers, chauffeurs, etc.

Transport is allotted as required, carrying the personal effects of the Staff, as well as electrical apparatus for lighting purposes.

The Infantry Brigade transport carries working tools for a party of 500 men.

ESTABLISHMENT OF STAFFS ON THE LINES OF COMMUNICATION.

<i>Appointment.</i>	<i>H.Q. of I.G.C.</i>	<i>H.Q. of Lines of Communication Defences.</i>	<i>A.B. Base.</i>	<i>Advance Base.</i>	<i>D.A.G. Base.</i>
G.O.C.	1	1	1	1	
<i>General Staff.</i>					
G.S.O. 1	1				
G.S.O. 2	1	1			
G.S.O. 3	1				
<i>Joint Control.</i>					
D.A. and Q.M.G. ..			1	1	
A.A. and Q.M.G. ..					
D.A.A. and Q.M.G.			2*		
<i>A.G. Branch.</i>					
D.A.G.					1
A.A.G.	1				2
D.A.A.G.	2	1			5
<i>Q.M.G. Branch.</i>					
D.Q.M.G.					
A.Q.M.G.	1				
D.A.Q.M.G.	1	1		1	
<i>Personal Appointments.</i>					
A.D.C.	1	1			
Orderly Officer ..					
<i>Special Appointments.</i>					
A.P.M.	1				
Camp Commandant	1				
D.J.A.G.					1
Principal Chaplain ..					1
<i>Attached.</i>					
A.D.M.S.			1	1	
Staff Captains ..			7*		
Sanitary Officers ..			1	1	

* One D.A.A. and Q.M.G. and six Staff Captains act as Military Landing Officer and Assistants respectively.

NOTE.—The H.Q. of Defence and Administration Sections and Posts are detailed by the G.O.C. Defences and the I.G.C. respectively as the circumstances demand.

EMBARKATION DUTIES H.Q.

Embarkation Commandant ..	1	<i>Railway Transport.</i>	
Assistant Commandant ..	7	A.D.R.T.	1
Quartermaster ..	1	R.T.O.	30
<i>Staff.</i>		<i>Medical Services.</i>	
Embarkation Officers ..	9	Embarkation M.O.	1
Assistant Officers ..	27	Medical Officers	5
D.A.A.G.	1	Q.M. in charge of Medical	
D.A.Q.M.G.	1	Stores	1
<i>Pay Department.</i>		<i>Special Appointments.</i>	
Paymaster	1	A.P.M.	1
		Officer in charge of inquiry	1
<i>Ordnance.</i>			
Ordnance Officers	3		

With complete complement of clerks, police, orderlies, messengers, etc.

CHAPTER V

ADMINISTRATIVE SERVICES AND DEPARTMENTS

Representatives on Staff, Responsibility of—Relations to Staff and Heads of Service.

THE duties of the Administrative Directors are as follows:

DIRECTOR OF ARMY SIGNALS.

Organization and maintenance of all means of intercommunication, including visual, electrical, and mechanical, and despatch-riders throughout the theatre of operations. He is responsible for the administration of the signal troops, and for the employment of those not allotted to subordinate commands, in accordance with the orders issued by the Commander-in-Chief.

His representative at the Headquarters of the I.G.C. is responsible to the Director of Army Signals for the administration of the signal troops allotted to the Lines of Communication and to the I.G.C. for their distribution and employment.

DIRECTOR OF SUPPLIES.

Provision of all food, forage, fuel, light, and disinfectants; administration of personnel engaged in this service.

DIRECTOR OF ORDNANCE SERVICES.

Provision of ammunition, equipment, clothing, and stores of all kinds other than medical or veterinary stores. Provision of technical vehicles of Artillery and Engineer units,

and of workshops on lines of communication for the repair of damaged material of all kinds. Administration of personnel engaged in these services.

DIRECTOR OF TRANSPORT.

Provision and distribution of all transport, excluding railway and sea transport, but including inland water transport. Administration of transport personnel. If inland water transport is used to a large scale, a separate director for this service may be appointed.

DIRECTOR OF RAILWAY TRANSPORT.

Provision of railway transport and administration of railway transport personnel. Control, construction, working, and maintenance of all railways. Provision of telegraph operators for railway circuits. Control and working of telephones and telegraphs attached to the railway service. For the erection and maintenance of all telegraph circuits on railways which are worked by the troops. A representative of the Director of Army Signals will be attached to his Headquarters, and the necessary signal troops allotted to him as may be ordered by the I.G.C.

DIRECTOR OF WORKS.

Provision, construction, and maintenance of buildings, offices, stores, camping grounds, roads, etc., on the lines of communication. Provision of water-supplies, gas, electric lighting, or other technical plant required for military purposes on the lines of communication, and not provided by other services.

DIRECTOR OF REMOUNTS.

Provision, training, and distribution of all animals. Administration of remount personnel.

DIRECTOR OF VETERINARY SERVICES.

Care of sick animals, provision, and maintenance, and administration of veterinary hospitals, and advice as to their distribution. Provision of veterinary stores. Inspections and recommendation with reference to the health and efficiency of the animals of the force.

DIRECTOR OF MEDICAL SERVICES.

Care of the sick and wounded. Provision and administration of hospitals and convalescent depots. Provision of medical equipment. Recommendations regarding precautionary and remedial measures relating to billets, camps, garrisons, hospitals, transport, dress, duties, etc., conducive to the preservation of health, and to the mitigation or prevention of disease in the army and civil population. Subject to sea transport arrangements, control of hospital ships as far as their medical equipment and readiness for reception of invalids is concerned.

DIRECTOR OF ARMY POSTAL SERVICES.

Provision and administration of all postal communications. (The directions of the Postmaster-General in matters of a technical postal nature are observed.)

DEPUTY JUDGE-ADVOCATE-GENERAL.

Is the representative of the Judge-Advocate-General, and advises the Commander on matters of military, martial, and international law.

PRINCIPAL CHAPLAIN.

Is responsible for the spiritual administration and welfare of the army.

PAYMASTER-IN-CHIEF.

Is charged with the general supervision of the pay and cash accounting services. Supervises and controls the personnel and organization of all Paymasters' Offices, and sees that all moneys are properly accounted for.

DUTIES OF ADMINISTRATIVE SERVICES AND DEPARTMENTS.

The Administrative Services and Departments are responsible for the provision of all material requirements of the forces in the field, their care, and care of their equipment. They are essential to the fighting force, since its efficiency depends upon the proper working of the administrative units.

There are three departments—namely, the Law, Chaplain's, and the Pay Department—the others all being referred to as "services."

At the head of each service there is a Director, who has a number of assistants scattered through the various commands to look after the details affecting the particular service within that command. As has already been stated, the Directors are attached to the Staff of the Commander-in-Chief or to the I.G.C., Deputies being appointed to the other formations in each case. The Directors of Army Signals, Supply, Transportation, and Medical Services, are usually attached to General Headquarters, the remainder being attached to the Staff of the I.G.C. The distribution is fixed by the Commander-in-Chief, who will fix the positions of the various offices of the Administrative Directors.

The duties of the representatives on the smaller formations only differ in degree from those of the Directors attached to General Headquarters, whilst those attached to administrative commands on the lines of communication are similarly affected.

Administrative Officers are responsible for advising their

Commanders in all technical matters relating to their particular branches, and subject to the instructions they receive, they direct the operations of all units of that branch within that command. In matters of a distinctly technical and routine nature, they deal through their own departmental chiefs, but all questions affecting the tactical operations of the force to which they are attached must be submitted to the Commander of the formation or base. In this respect, the routine operation of their services or departments is not interfered with by the Commander, but where variations are necessary his instructions are paramount. The Commander of the forces purposely leaves the routine to the Administrative Services, and will rarely interfere with their working, but his power to do so is undisputed.

The various services deal through the Staff of a command, receiving their instructions through the branches with which their duties are allied, as has already been explained in discussing the Staff. In the absence of a representative on the Staff, the Commander of the units in the command is the responsible Officer for that particular service.

Every Officer of the administrative services or departments is held responsible that all moneys, supplies, etc., handled through his command are properly applied. He must be certain that only authorized issues are made, and, where departures from regulations are ordered, he must get the required authority for issue. Where public moneys are to be handled, the limitations of expenditure will be fixed by the Director of the Service or Department, together with such regulations as may be necessary regarding quality, use, etc. Each Officer administering public money is personally responsible for all expenditure, and is liable for any maladministration.

The accompanying list of duties illustrates the duties of the various services and departments, which we shall discuss in detail in subsequent lectures.

It should be fully appreciated that the direction of the Staff over Administrative Services is only intended to govern the movements of their transport, their location, and orders as to possible and immediate requirements. Beyond this, the responsible Officers operate their own departments in accordance with the instructions received from the Director.

ADMINISTRATIVE STAFF ATTACHED TO HEADQUARTERS IN THE FIELD.

<i>Service.</i>	<i>General H.Q.</i>	<i>Adminis- trative H.Q.</i>	<i>Army H.Q.</i>	<i>Corps H.Q.</i>	<i>Cavalry Division H.Q.</i>	<i>Infantry Division H.Q.</i>
<i>Signals.</i>						
D.A.S.	1			<i>Note.</i> —The duties are performed by the Officer in charge of Signals,		
D.D.A.S.		1				
A.D.A.S.	1	1				
D.A.D.A.S. ..						
<i>Supplies.</i>						
D. of S.	1					
D.D.S.		1	1			1
A.D.S.	1	1				
D.A.D.S.	1	1	2			
<i>Ordnance Survey.</i>						
D.O.S.	1					
D.D.O.S.		1	1			
A.D.O.S.	1					
D.A.D.O.S. ..		1	1		1	1
<i>Transport.</i>						
D. of T.		1		<i>Note.</i> —The duties of Supplies and Transport are combined in these formations.		
D.D.T.	1					
A.D.T.	1	1				
D.A.D.T.	1	1				
<i>Railway Transport.</i>						
D.R.T.		1				
D.D.R.T.	1					
A.D.R.T.		1				
D.A.D.R.T. ..						

ADMINISTRATIVE STAFF ATTACHED TO HEADQUARTERS
IN THE FIELD—Continued.

<i>Services.</i>	<i>General H.Q.</i>	<i>Adminis- trative H.Q.</i>	<i>Army H.Q.</i>	<i>Corps H.Q.</i>	<i>Cavalry Division H.Q.</i>	<i>Infantry Division H.Q.</i>
<i>Works.</i>						
D. of W.		1		<i>Note.</i> —These appointments are filled by the Engineer H.Q. accompanying the formation.		
D.D.W.	1					
A.D.W.		1				
D.A.D.W.						
<i>Remounts.</i>						
D. of R.		1				
D.D.R.	1		1			
A.D.R.		1				
D.A.D.R.						
<i>Veterinary Service.</i>						
D.V.S.	1					
D.D.V.S.		1	1			
A.D.V.S.					1	1
D.A.D.V.S.						
<i>Medical Service.</i>						
D.M.S.	1		1			
D.D.M.S.		1	1			
A.D.M.S.	2				1	1
D.A.D.M.S.		2			1	1
<i>Postal Service.</i>						
D.P.S.		1			<i>Note.</i> —Duties are performed by the Postal Section accompanying the formation.	
D.D.P.S.						
A.D.P.S.	1	1	1	1		
D.A.D.P.S.						

NOTE.—Supply duties in connection with a Cavalry Division are carried out under the direction of a Cavalry A.S.C. H.Q., which is commanded by a Lieut.-Colonel assisted by an Adjutant and two A.S.C. Officers, one of whom looks after requisitions and the other Distribution and Supply.

CHAPTER VI

STRATEGICAL CONCENTRATION

Preparations in Time of Peace—Mobilization—Strategic Advance—Landing of Army—Consolidation of Landing—Preparations for Arrival of Main Body—Advance-party.

BEFORE proceeding to discuss the operations of the various parts of the Army, it may be well for us to review the situation immediately prior to the outbreak of war, and to study the developments whereby our forces come into being and concentrate in the field.

When hostilities appear imminent, the Government, through the Cabinet, is responsible for furnishing information to the Military and Naval Authorities in order that they may make the necessary preliminary arrangements for the mobilization of the troops. As soon as the declaration of war is made by Royal Proclamation, orders are issued for the necessary steps to be taken to bring the Army from a peace to a war footing.

Simultaneously with the declaration of war, orders for the mobilization of the forces are issued and promulgated. The War Establishments, which have previously been issued, as confidential documents, to all Commanders, immediately become effective, and each Commander commences to place his unit on a war basis. The methods by which the extra personnel, animals, transport, equipment, etc., are provided will be discussed later when dealing with the services concerned. The process of passing from the peace to the war

footing is designated "mobilization," which is only effected when every unit is complete in men, animals, and equipment, and is ready to take the field.

In time of peace the General Staff at the War Office is responsible for amassing information regarding all countries and peoples with whom we are likely to be engaged in war, such information covering the military and naval forces; shipping and railway facilities; industrial areas; food-supplies; agricultural data, etc., in order that the resources may be turned to our advantage in the case of a campaign being waged in the particular country. Upon the information which is so gathered, our General Staff is held responsible for the preparation of plans, both offensive and defensive, and for such revision as may be necessary under changing conditions. These plans, with the accompanying information, are filed away until the moment of the declaration of war, when such changes as the situation at the moment may render necessary are made. The Commander of the Forces having been appointed, he is presented with these plans, and, strengthened by the information which has been gathered, and which has been considered carefully when time offered every advantage in weighing up each factor before making a decision, he enters the arena with a mass of the detail already figured out for him. Time-tables of movement, rail and shipping data, landing-places, and the facilities which will be available or may be seized by force, are all carefully tabulated, and the first steps taken by our armed forces will be to consolidate them for our own service.

During the period of mobilization it may be assumed that the enemy will be engaged in similar pursuits to ourselves, and that he will be hurrying his mobilization in order to get the advantage of the first onslaught. Each side will be able to throw its standing armies into the fray with little delay,

but each will require more time for the mobilization of the reserves rejoining the Colours.

As soon as it is possible, each side will throw its forces into the field, and advance rapidly against the resources which it desires to seize and hold. Time is therefore a matter of great moment, and the greatest success will attend the force which has made the most complete arrangements for concentration, and which is able to carry them into effect without confusion.

As soon as the mobilization is sufficiently advanced to permit movement, the Commander-in-Chief will embark his forces. Since he will try to establish himself in the enemy country, his first requirements will be that of Cavalry and very mobile forces. The circumstances under which the troops must be landed will have a marked effect upon his dispositions. If the landing is likely to be opposed, a naval action will probably take place before the actual landing can be accomplished.

In that case the arrangements will have to be made in conjunction with the Naval advisers. The plans will be modified accordingly, and it may be necessary to land a force of Infantry to hold what has been forced, and under cover of their protection the remainder of the forces would be landed. If the landing is unopposed, then the arrangements for landing will only need to be adjusted according to the transport available, upon which matter the Naval Authorities will advise.

Once a landing has been effected, the establishment of a system of supply and administration will be commenced. As soon as the covering screen is in position, the Staff necessary to conduct the preliminary arrangements for the landing of the main armies will be landed and will start their arrangements without delay. This Staff will consist of representatives of the Commander-in-Chief (should he

not land with the advanced troops), the Headquarters of the I.G.C. and G.O.C. Defences on the lines of communication. The Headquarters of the Base Commandant, with representatives of the Headquarters of the different Administrative Services, sufficient personnel and equipment to enable them to commence operations. As soon as they are landed they will each undertake the duties of their own departments under the direction of the I.G.C. That Officer will take the necessary steps to arrange for the allotment of quays, wharves, landing-stages, etc., in which he will be advised by the Director of Sea Transport, and will prepare time-tables for disembarkation and orders for the movement of the arriving troops to their quarters. He will issue orders for the allotment of quarters, offices, depots, ground space, etc., to the various units and services, for which purpose he will appropriate the required buildings, stores, warehouses, etc. He will also take over industrial facilities such as electric lighting, waterworks, gas, power, and manufacturing plants, according to requirements, and will take over the railways and available trucks and locomotives. In order to get the maximum advantage of the local resources, he will seize the food-supplies available, using them for the maintenance of the advanced troops, pending the arrival of his own supplies, etc. He will seize all local transport and animals, and organize labour, where possible, to assist in the landing of the main forces. Whilst these preparations are in progress, each service will take the necessary steps to utilize such facilities as may be handed over to them, in order to be ready to carry on their work at the earliest possible moment.

Whilst these arrangements are being perfected, the troops will push forward and seize whatever facilities may be within reach, and will deliver them over to the proper authorities, in order that they may be promptly utilized. The advanced

troops will be supported as rapidly as possible with other troops, for which purpose a body of Infantry will be landed. As soon as the lines of communication have been extended forward, the defence troops will be pushed up to consolidate and hold them. The advanced troops will usually live upon the country by billeting and requisition in order to relieve the pressure on the Administrative Services. Special attention is paid to points of strategic value, such as railway junctions, repair shops, granaries, etc., which are occupied and held. Any rolling stock which can be seized is promptly sent to the base in order to assist the advance of the main body.

Should the advance be extended very far into the country, the establishment of forward arsenals, supply depots, etc., becomes important, and for this purpose important railway junctions are usually held and made use of. The limitations as to the distance of these depots from the landing-place will be governed by the success attending our arms, and will be fixed by the Commander-in-Chief. When establishing these bases, the first reserves will be obtained by forwarding additional quantities of material, above the quantity actually required by the advanced troops, the extra supply being held at these depots until eventually they reach the maximum which has been decided upon by the Commander-in-Chief. A number of these advanced depots may be established, and should be so situated as to be distributed over the front. The railways will be the chief factors as to their situation, since the forward rails from the depots toward the troops are of vital importance. One of these depots may supply several bodies of troops, and converging lines will be used for this purpose. In distributing the depots, every effort is made to provide a chain covering the whole front which will enable the forces to fall back upon a depot should the line be pierced at any point. These depots must

be sufficiently far back not to provide an encumbrance to the mobile troops from being in an exposed position, but should be as far forward as is consistent with their safety. The various depots will be explained more fully in a lecture on Lines of Communication.

During the development of the lines of communication, the concentration of the main armies will be in progress. Owing to the time required to embark Cavalry and transport, bodies of Infantry will be embarked with proportions of the other arms. As soon as the forces are landed they will be taken to concentration camps, and the various formations assembled, preparatory to the advance, which may be by road or rail according to the distance to be travelled. If the troops are to travel by road, the marches will commence by easy stages, increasing in length each day, until men and animals are hardened. As each formation landed will bring its own administrative units, the administrative personnel will be building up, and the chain of supply, which we will discuss later, becomes completed.

As the troops advance farther forward, the railways will be available for military uses, and the railhead will be advanced, any repairs necessary being effected at the earliest possible moment. In course of time it may become necessary to advance the forward depots, or additional depots may be established. Each step forward will be consolidated by the Lines of Communication Defence Troops, and the Administrative Services will avail themselves of increasing facilities for the better carrying out of their work. In order to gain as much ground as possible, the force will be moved on a broad front, making the fullest use of all roads for this purpose.

During the whole of this time the enemy force will be trying to accomplish similar aims, and to circumvent them it is necessary that no time be lost on our part. The success

of the strategic concentration depends to a great extent upon the care with which the preliminary arrangements have been prepared in time of peace, and that no hitch in carrying them out should occur in time of war. The size of the force available during mobilization will naturally be limited, and consequently every available soldier should be used in the field force in order to throw the greatest weight into the preliminary encounters. To accomplish this, civil labour and transport must be used as far as possible on the lines of communication. In the field unit only the trained soldier can find a place during this period, but on the lines of communication the standard of efficiency is not so insistent during this concentration as far as the lower grades of work are concerned, so that the greater use can be made of local labour. In regard to the operation of public facilities, the local administration should be adopted where the conditions admit.

The importance of the lines of communication at this time cannot be too highly estimated. The Commander of the Field Force must keep his eyes turned towards the chain of supply, since the limits of his advance are measured by his power to obtain all that he requires to maintain his force, and to get rid of all encumbrances in the shape of the unfit, prisoners of war, hostile inhabitants, etc. He will take advantage of all local supplies, but in ammunition and ordnance he cannot expect to obtain any stores, and consequently he must rely upon his own administrative service behind him.

During the concentration precedence must be given to the more urgent materials and personnel. The transport available for the overseas journey will materially affect the quantities which can be forwarded, and the greatest care must be exhibited in seeing that unnecessary material is held back until more transport is available.

The secret of successful concentration lays in the peace preparations, and they must extend to every possible contingency which foresight can anticipate. Careful estimates as to the time required to mobilize the various bodies of troops, to entrain, embark, and disembark them, must be made, and time-tables drawn up accordingly. Every Officer and man must strain every effort to keep up to the time-table, otherwise hopeless confusion may result. An allowance for mishaps is made, but if a number of units defalcate, that margin for safety is soon absorbed. During the concentration the closest co-operation must exist between the Home Staff, the Naval Authorities, and the Staffs on the lines of communication and in the field. Only by the closest combination of effort can the concentration be completed without loss of time. The results of failure to conform to time-table cannot be estimated easily. Positions of the greatest importance may be lost, and months of heavy fighting may be necessary to win them back. During this strenuous time each Commander is striving to get into a position of advantage, to select fields of operations favouring his side and which place the enemy at a disadvantage. The situation may be easily reversed by a few hours' delay, with its consequent loss of ground and opportunity.

Great care must be used in regard to the civil population during these preparations, and if necessary martial law will be proclaimed and enforced. Early steps should be taken to control all means of communication and the movement of the inhabitants in order to prevent illicit communication with the enemy. The aircraft of each side will be particularly active during this time in an effort to discover the plans of the other side, and their efforts may be largely assisted through information gained by spies. The Cavalry in advance will throw out its screen for strategic reconnaissance in an effort to break through the corresponding force

on the enemy side, to find out his dispositions, and thus disclose his plan of operation.

Once the strategical concentration has been accomplished and the situation developed, the routine of the field comes into effect, and the chain of administration which we shall now discuss is adopted.

CHAPTER VII

LINES OF COMMUNICATION

Advance of Main Body—Building up—Home Bases—Overseas Bases—
Advanced Bases—Regulating Stations—Railheads—Rendezvous
—Refilling Points—Connection with Field Force—Operation of.

By the term “ lines of communication ” we allude to all roads, waterways, railways, etc., over which supplies and personnel are transported to an army in the field, between the home bases and the firing-line. In the case of our forces operating in an overseas country this means that our lines will commence in England with the home railways, thence by sea, and possibly by river, thence again by rail and road to the troops.

The lines of communication are the arteries through which the life-blood of the force is pumped, and any interruption to them must result in the loss of life to the forces. The life-blood in this case is represented by the supplies, ammunition, stores, etc., which enable the force to carry on its operations. The lines of communication are therefore most vulnerable points, and if attacked successfully may bring about a complete victory, regardless of the size of the force in front of them. They must be adequately protected, therefore, for which purpose the Lines of Communication Defence Forces, to which we have previously alluded, are provided. Since every article which the field forces require must pass over these lines, they must be carefully administered, in order to avoid the interruption which congestion might produce.

The lines of communication are usually decided upon in time of peace, from data gathered through many sources. Under the General Staff at the War Office plans of operation against all possible enemies, both offensive and defensive, are prepared. The information gathered will need to cover a broad field, including such vital matters as harbour accommodation; railway lines, trucks, sidings, repair shops, etc.; industrial facilities, such as power, light, heat, and warehouse accommodation. From the information thus gathered, the lines of communication most suitable for the operations proposed are selected, and the facilities which it is proposed to seize and employ are decided upon. The first essential is good harbour and dock accommodation at a suitable port, and the second good railway facilities, in order to distribute the material over the area of operations. Where these are not forthcoming, arrangements must be made to construct them, taking advantage of such facilities as the locality may present.

The *Home Base* is the source from which all supplies, etc., are received, and in the case of the British Empire this will usually be Great Britain. In the home area arrangements will be made to produce the required articles, for which purpose munition works and other manufactories will be organized. Their products will then be placed on the railway and conveyed to the ports for embarkation. The Home base will therefore look after the manufacture, the assembly at suitable ports, and finally their embarkation on vessels to carry them overseas. The War Office will supervise this part of the work, and until the stores are placed on the steamer they will not come under the actual control of the field forces; therefore we shall not discuss them at length. The responsibility for providing all that may be demanded by the field forces rests with the War Office, which is, of course, subject to the control of His Majesty's Government.

Once the articles are provided, however, and are assembled at the port, they come under the direction of the Commander-in-Chief, who is responsible for their proper use. Since we are discussing the field armies, we are not concerned with what takes place on the Home side, except as far as they connect with the field operations. Having placed the stores on the vessel, they are carried to their destination, where we find our next depots.

The *Overseas Base* or *Bases* are located at the ports which have been previously selected. To be suitable for the purpose, we must have good anchorage and good docks. The railways from the port should radiate toward the area of operations, preferably in a vertical direction, since they then afford less opportunity of interposing a force between the base and the army. Lateral communications offer the possibility of the forces being driven back and across their communications, when they would be hopelessly lost.

As the Overseas base or bases are to be the receiving-stations for the huge quantities of material that the armies will require, there will necessarily be a large staff to handle them, and for these accommodation must be found. The stores themselves will require warehouse accommodation, and as the reception of the large quantities will be carried on by day and by night, it will be necessary to have good lighting facilities. The bases for a large army will need all of the facilities which are usually found in every large port, and where the same cannot be found ready to hand, early steps must be taken to provide them.

At the bases there will be established the base depots to receive the various stores; these will be placed under their respective services, each, of course, having its own personnel and a proportion of transport. Certain bases may be used for stores of one kind, others being used for different stores, but at the Overseas base will be found Supply, Ordnance,

LINES OF COMMUNICATION.

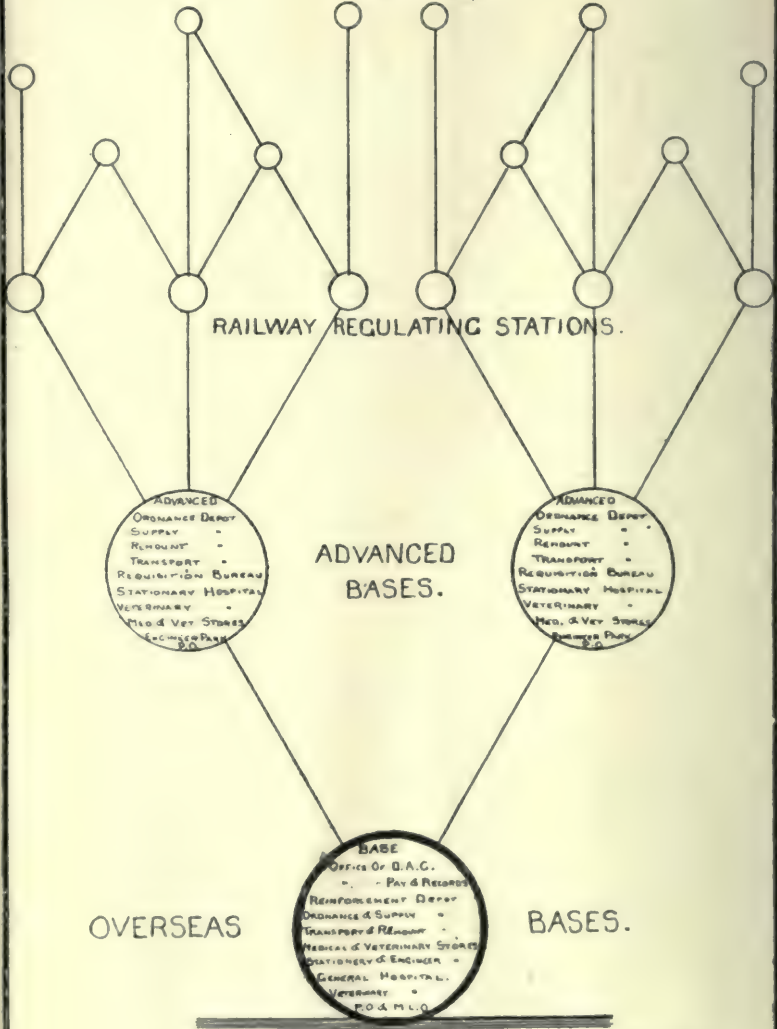
RAIL HEADS.

RAILWAY REGULATING STATIONS.

ADVANCED BASES.

OVERSEAS

BASES.



- ADVANCED
- ORDNANCE DEPOT
 - SUPPLY
 - REINFORCEMENT
 - TRANSPORT
 - REQUISITION BUREAU
 - STATIONARY HOSPITAL
 - VETERINARY
 - MED. & VET STORES
 - ENGINEER
 - P.O.

- ADVANCED
- ORDNANCE DEPOT
 - SUPPLY
 - REINFORCEMENT
 - TRANSPORT
 - REQUISITION BUREAU
 - STATIONARY HOSPITAL
 - VETERINARY
 - MED. & VET STORES
 - ENGINEER
 - P.O.

- BASE
- OFFICE OF D.A.C.
 - PAY & RECORDS
 - REINFORCEMENT DEPOT
 - ORDNANCE & SUPPLY
 - TRANSPORT & REINFORCEMENT
 - MEDICAL & VETERINARY STORES
 - ENGINEERS & ENGINEER
 - GENERAL HOSPITAL
 - VETERINARY
 - P.O. & M.L.O.

Remount, and Troops Depot, whilst Engineer parks, stationery, medical, veterinary, and other stores, will be located there for the supply of the various services. The office of the Deputy Adjutant-General, the Chief Paymaster, and Military Landing Officials, will be situated there.

The base will be established as a separate post both for defence and administration.

For the defence there would be allotted a strong garrison, and as the base may be liable to attack by sea, the force would include armament of a fixed nature to repel naval attack. In preparing plans for its defence, the Commander would co-operate with the Naval Authorities.

The Base Commandant would be in charge of the administration, and representatives of all Administrative Services will be attached to his Staff. The Director of Sea Transport would have his office there, and, through Military Landing Officers attached to the Staff of the Base Commandant, would make the necessary arrangements for docking vessels as required, and for removal of surplus material or of sick and wounded by outgoing vessels.

There may be several Overseas bases, in which case there will be some modification in the number of depots at each. The distribution of the several bases will be made with due regard to the railway and other facilities.

At these bases all personnel, supplies, stores, etc., will be received, passed to their respective depots, and moved from there toward the firing-line. Issues will be made to the lines of communication troops in the vicinity as required.

We shall study the operations of the different links in the communications more fully later.

As the army advances, it will be necessary to bring reserves of material closer to the units, for which purpose a number of advanced depots will be established, which will be fed from the bases. One base may supply several advanced

bases. The number of advanced bases will vary with the area, but as many as may be necessary will be established, the object being to place a number of depots in available places closer to the firing-line, in order to minimize the results of possible interruptions from any cause.

Advanced Bases are established as close to the firing-line as the tactical safety will permit, subject, of course, to the required facilities being available. The Commander-in-Chief will issue instructions as to the location, publishing the same in orders for the information of all concerned.

The advanced bases require similar facilities to those of the bases, with the exception of the docking, although inland water transport may be used, when canal or river docking would be required. Railway accommodation is necessary to carry the materials farther forward.

Warehouse, lighting, and power accommodation is required to enable the necessary depots to be established and operated. Depots for supplies, ordnance, remounts, personnel, medical and veterinary stores, etc., will be established, and quarters for the personnel to operate them must be found.

As in the case of the base, a Defence Force will be detailed to protect the place, which will be made a separate post under its own Defence Commander. The Defence Troops draw their supplies direct from the depots by means of their own transport.

An Administrative Commandant will represent the I.G.C. in administration and control, and will supervise the work and movement of all transport in regard to the units in the command.

Advanced bases supply the normal requirements of the field forces daily, special materials being drawn through them on demand from the base, where they cannot be met locally. The issues made from these bases are automatically replaced by the bases.

The trains carrying the requirements of the field force are made up at the advanced bases and moved forward towards the railheads, which will be as near the field of operations as the tactical conditions will permit. Since these railheads will be situated in regard to the tactical situation, rather than that of convenience, it will frequently happen that the accommodation in sidings at railhead will be limited; consequently, care must be taken that traffic is not allowed to accumulate at the end of steel in such a way as to hold trucks on sidings, after being emptied, through lack of tracks on which to shunt them out. To this end, junctions and industrial centres having good siding space which intervene between advanced base and railhead are used to regulate traffic.

Regulating Stations are placed where traffic can be marshalled prior to its despatch to railhead, with the object of avoiding congestion at the end of the line. Trains are placed on sidings until the empties on tracks at railhead are evacuated, when loaded trains replace them; consequently every truck may be placed in operation, a most important thing in war where trucks are always scarce.

Railhead, as applied to military conditions, does not necessarily mean the end of steel. It means the end of the line as far as traffic is concerned. Beyond that point it is not possible to use the tracks, usually through the possibility of tactical interference. As the army advances, the rail will be pushed forward behind them, so that its position will constantly change in mobile warfare. In selecting the position the question of loading and unloading accommodation must be considered, since there will be a mass of material arriving daily. The use of motor transport has made it possible to hold the railheads farther back, since a motor lorry carrying three tons of material can cover a distance of ninety miles in a round trip. With such a margin it is

always possible, in cultivated countries, to utilize a station having some siding accommodation, which may later be extended, as a railhead. The material must be carried by motor transport on leaving the rail, and the addition of a few miles to the motor journey does not handicap the system of supply.

The lines of communication as far as railhead are more or less of a permanent nature. The railways are utilized, improved, and applied to our needs. When we can no longer move by rail, we move forward by road. The direction will depend upon the movements of the field army, and these vary every day; the movement of the connecting-links must correspond. The position of the points where actual connection is to be made can only be defined by those conversant with the plans of the Commander, and as he does not desire that his plans should be made public, he cannot inform the lines of communication authorities of his intentions. It is sufficient if he defines the point at which contact will be made, and arranges for someone to be there to direct the movement of traffic. This is what is actually done.

The *Rendezvous* is a movable point, fixed by the Field Force Headquarters, at which the Officer of the service concerned attends, receives the incoming convoys, and then redirects them on to the transferring points.

The Commander of the Field Force fixes the actual point of contact, which he notifies to the lines of communication authorities. They move their transport to that point, where they are met by an Officer representing the Staff or the Administrative Service, who divides the convoy up according to requirements, and then redirects it on to the point where the load is transferred to the Field Force Transport.

If a railhead supplied an army in advance, there might be an army rendezvous fixed by Army Headquarters, at which the army Officer would attend, divide the convoy

into corps convoys, with, perhaps, one for the army troops, and then redirect the small convoys on to the various corps rendezvous, at which they would be again divided into divisional convoys, which are redirected on by the corps Officer. Occasionally they will be again divided and directed to brigade areas by a divisional Officer, when they actually transfer their loads into the field transport.

Refilling Points are the actual positions to which the convoys move to transfer their loads. They are usually placed in easily identified positions, offering sufficient room for the transfer of supplies from the motor to the horse transport.

The position of rendezvous will vary according to the movements of the force in advance, and the number of rendezvous will depend upon whether several divisions are operating in a close area. Frequently it will be possible to allot a railhead to each corps, or even to a division, in which case the Headquarters concerned will fix the point and notify the lines of communication officials. The Commander-in-Chief will delegate power to fix rendezvous to the Officers concerned. In many cases it may be advantageous to transfer loads at the rendezvous, in which case the rendezvous and refilling points would be at one and the same place. When troops are stationary it will often be possible to send the convoys right up to the area occupied by the troops, transferring direct into regimental transport. In all cases the tactical position must decide the issue, and care is exhibited that congestion of traffic in the field of operations is avoided.

Having briefly enumerated the various points on the lines of communication, we may proceed to connect them up in a little more detail.

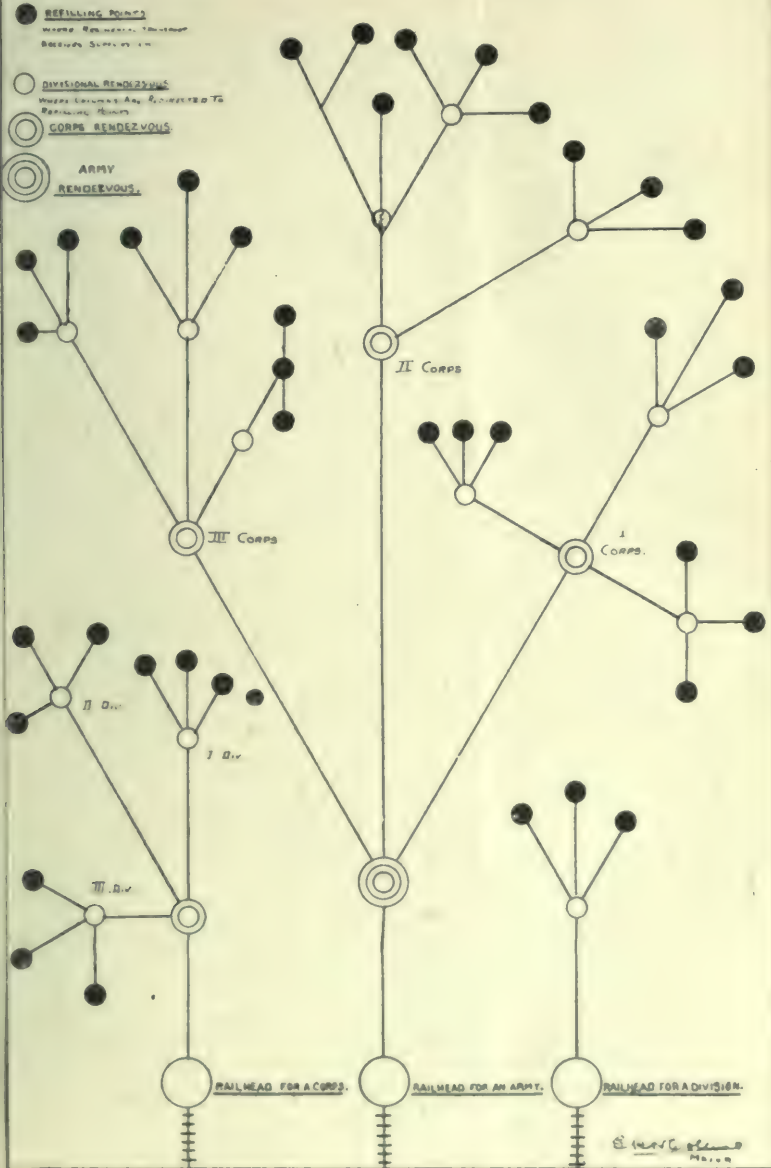
If we take a tree for the purpose of illustration, we may accept the roots as representing the Home railways, gathering their nutriment in the form of necessary materials and

concentrating them upon one main line, represented in our study as the collection of munitions, supplies, etc., and concentrating them at the Home ports—*i.e.*, the base of the trunk of the tree. The tree-trunk represents our main base and the main communications. Proceeding up the trunk—*i.e.*, the railways—we arrive at several large branches radiating in different directions, which represent our advanced bases, the number being varied according to the size of the tree—*i.e.*, the force. Proceeding along one of these branches, we arrive at a terminal where the small branches branch off. This would represent our railhead, the small branches representing the roads leading towards our armies.

Along the branch we come to a fork with two or three small branches. Here we get a corps rendezvous, assuming that the direction along the small branches was guided by a controlling official. Proceeding along one of the small branches, we encounter another fork, again the divisional rendezvous, and following one of these branches along we find a series of smaller forks, until we get to the leaves, representing our troops.

Applying this illustration to our military studies, we find that we concentrate our strength at one main store, the base, the substance being gathered by the roots, or fibres, of the Home rail system. Having concentrated our stores at one point, the next problem is to distribute them. If we were dependent upon one line, an accident to a train might jeopardize our whole force. To bridge the gap which might be created, we scatter our stores in a number of smaller depots distributed over our front, nearer the firing-line, but far enough removed to prevent the possibility of capture by the enemy. From these we get our branch railways running out to a number of railheads. Again we protect our forces by having several points to which we can send for supplies,

LINES OF COMMUNICATION.





should one break down. At the railheads we send out large columns of stores, moving them in a compact mass, thereby reducing the number of troops required to protect them. At a convenient point we break up the columns into smaller columns, under the direction of an Officer representing the large forces, and again send them on towards the troops in advance. Farther along the road we may again divide our columns into several parts, sending each by the shortest journey to its destination. This division is again supervised by an Officer of the field forces who is acquainted with the distribution of troops. This process of dividing the columns continues until the column is reduced to a number of small units which move up to the field transport, and there transfer their loads into the different field units. The process is continued under the field force direction until the distribution reaches the smallest part of the unit, when the supplies are issued to the soldier.

As soon as the lines of communication transport has transferred its load, it returns by the same route, assembling at each of the rendezvous, until it arrives back at railhead a compact but empty column, when it repeats its programme on the following day.

The aim of our organization on the lines of communications is to reduce the possibility of a breakdown of supply by placing a number of depots in such positions that if communication breaks down between any one, it may be bridged by the others, whilst the chain of administration facilitates the division of the mass into a number of small parts spreading out fanshape until the distribution reaches to every part of the field.

We shall see the actual operation as we take each subject in detail later.

It will be seen that the establishment of the point of connection, movement of transport, and co-ordination of

all services, demands the closest co-operation between the field force and the lines of communication authorities. The I.G.C. is responsible for seeing that the necessary supplies are forthcoming, and for arranging the time-table of movement of transport. He appeals to the G.O.C. lines of communication defence for the required protection for the columns, and the escort provided moves with the column until it reaches the limits of responsibility as fixed by the Commander-in-Chief. As a rule the responsibility of the lines of communication authorities ceases at a rendezvous, but the exact point is fixed by the Commander-in-Chief. Wherever that point may be, the protection and direction is assumed by the field forces, and is continued until the transport has been returned to the point where the lines of communication again assume control.

The Commander-in-Chief will from time to time issue instructions as to the situation of the various depots on the lines of communication, the railhead, and rendezvous. He will also fix the total reserve of stores to be carried, leaving the I.G.C. to control the distribution. All immediate and future requirements are notified to the I.G.C., who then becomes responsible for their provision, concentration, and despatch. Since many of the articles required will be of more urgent nature than others, it is necessary that there should be someone to fix the order of precedence, allotment of transport, etc., and that officer is the I.G.C. If his office were removed, the various departments would compete against each other in the attempt to make each department the most efficient from the viewpoint of supply; consequently there might be a surplus of food, with a shortage of ammunition, or *vice versa*.

To fully appreciate all that the lines of communication mean, we shall have to take the subjects in detail, and handle each service, which we shall do later, but it must be fully

appreciated at this time that the two parts of the force chiefly concerned—namely, the field mobile forces and the lines of communication forces—are closely allied, the one being dependent on the other. One will be constantly moving, whilst the other is comparatively stationary. Each has its own Staff, but the Commander-in-Chief commands the whole, and through his Staff he directs how the connection between the two is to be made. The I.G.C. is responsible for massing the needs of the force, and for bringing them to the point of contact with the field forces, where he hands them over to the Field Officers, who are then responsible for their distribution, and after unloading the lines of communication transport into the field transport, they return the empty vehicles to the lines of communication authorities at the point where they take them over. During each of these two operations adequate protection must be given to the columns, for which each part of the command is responsible within the area defined by the Commander-in-Chief.

The I.G.C. is solely responsible for the administration and control of the lines of communication, and co-ordinates the efforts of all services and departments on the lines, besides having the control of all troops, except the defence forces. The G.O.C. Defences is responsible for the defence and military government of the area of the lines of communication, and co-operates with the I.G.C. in protecting the lines, their depots, and moving columns.

Individuals passing over the lines must conform to the regulations issued by the I.G.C., irrespective of their seniority, and no person may pass over the lines without the consent of the I.G.C. in writing.

It must be remembered that the construction of railways and roadways in European countries is always considered in regard to the strategic requirements of the country, and

the industrial centres and strategic lines of advance are invariably well supplied with transportation facilities, which are turned to advantage in time of war. In subsequent lectures we shall refer to the various bases, but as we shall then be considering a particular service, we shall use the terms "base depot" or "advanced depots," when it must be understood that we refer to depots established at the places we have just been discussing in this lecture. Similarly, the railhead will be such a one as we have described. The rendezvous and refilling points are based on similar principles, except that there may be a separate position for supply, ammunition, etc.

CHAPTER VIII

MOVEMENT OF TROOPS AND STORES BY SEA

Co-operation of Royal Navy—Embarkation Staff—Classification of Vessels—Inspection of—Embarkations—Duties during Voyage—Military Landing Officers—Disembarkations—Loading and Unloading.

THE Royal Navy is responsible for the control, provision, and navigation of all vessels used for the transport of troops by sea, and in all operations which entail the use of shipping the plans of the movement will be drawn up in consultation between the Naval and Military Authorities.

The conditions under which troops may have to be moved will vary according to whether the destination is a place where the landing has to be forced or otherwise. In the former case the distribution of troops will have to be considered in regard to the plans which it is proposed to adopt when the landing has been effected. In the latter case the distribution of troops will be decided by the Military Authorities with sole regard to their own plans of campaign. In this case the procedure described in our lecture on Strategic Concentration will be followed, and sufficient troops will be sent forward to consolidate the defence of the port of landing, and the necessary administrative Staffs to complete the preparation for the arrival of the main forces. The transport available in each case will affect the plans, and the first troops to be moved will be decided with due regard to the accommodation ready. In both cases the earliest

moment at which it is possible will be used to perfect the arrangements for the reception of the troops and stores.

The division of responsibility between the Naval and Military forces may be defined as follows:

The Admiralty is responsible for the provision, docking, and navigation of all ships, as well as for the protection of same during the voyage. The operation of all ships' machinery is left to the Navy, although labour may be provided to assist within the limits mutually agreed upon. The Navy is usually responsible for the beach up to high-water mark, and where the landing takes place in boats, rafts, etc., they would be responsible for their navigation.

The Military Authorities are responsible for providing the Naval Authorities with information as to their possible requirements, the arrangement of military time-tables to conform to those which the two services prepare, and for the discipline and control of the troops when on board ship, subject always to the command which is vested in the master of the vessel. In embarking and disembarking, the Military Authorities are responsible for the provision of any labour which may be needed, and usually they will assist in the loading and unloading, with the exception that the ship's machinery is operated by Naval labour.

The Quartermaster-General at the War Office is responsible for making the Military arrangements for embarkation on the Home side, whilst the I.G.C. is responsible for the arrangements for disembarkation on the Overseas side.

The Quartermaster-General at the War Office will make arrangements with the Admiralty for the provision of vessels at mutually agreed ports, and will issue the necessary orders for the concentration of the troops or stores at those ports.

The I.G.C. will make arrangements for the docking and unloading of vessels Overseas, through the Director of Sea Transport, the Military Landing Officer acting as his inter-

mediary. These two officials will be represented at all ports by Assistant Military Landing Officers and Naval Transport Officers respectively, who will co-ordinate all arrangements at their particular ports.

On the Home side, Embarkation Staffs will be appointed at each port, under a Staff Officer in charge, and similarly the Naval Authorities will be represented by Naval Officers for embarkation duties.

In all operations requiring the co-operation of the two services, frequent conferences will be necessary to insure efficient service, and the Military Authorities will give the greatest amount of time that the circumstances will permit to enable the Naval Authorities to procure the necessary vessels.

The vessels used for the transportation of military stores and personnel are classified as follows:

Transports—ships wholly engaged for the Government service on time charter.

Freight-ships—ships in which conveyance is engaged for certain bodies of troops, but which are not wholly at the service of the Government.

These two classes are again divided into several categories, according to their use; thus:

Transports are classified—

1. For conveyance of units with or without animals, or drafts complete with their supplies, stores, etc.
2. As hospital ships.

Freight-ships are classified as—

1. For conveyance of personnel, as troop freight-ships.
2. For conveyance of animals and their attendants, as, remount or mule freight-ships.
3. For conveyance of stores, as stores freight-ships.

Upon the requirements of the Military Authorities being communicated to the Naval Authorities, the necessary vessels are allotted and berthed in the agreed ports. If they are to be used as troopships or for carrying military animals, an inspection of the vessel is held by a Board of Inspection consisting of one or more Naval Officers, the Military Embarkation Officer, and a Military Medical Officer. This Board will inspect the sanitary conditions, the ship fittings and accommodation, and will see that they are adequate for the transportation of the troops. Where they are not sufficient they will see that the necessary steps are taken to render them satisfactory. If animals are to be carried, a Veterinary Officer will also be on the Board. After this first inspection is made, and a certificate rendered, it will not be necessary to again inspect the vessel, except to see that the conditions are still satisfactory, the subsequent inspections being carried out by the Military Officials.

Upon the arrival of the troops at the port, they are directed by the Military Embarkation Officer to their ship, the allotment of quarters being pointed out to the advanced party supplied by the unit. Where large bodies of troops are being embarked, a representative of the "Q" Branch of the Staff of the formations should accompany the advanced party, in order to direct the various units on arrival. He assists the Embarkation Officer, but that Officer is paramount in his authority at his port.

As soon as the troops arrive, the Officer appointed from the unit will render to the Embarkation Officer a Parade State showing the number of men, animals, etc., medical certificates showing that the troops are free from infectious disease, and veterinary certificates regarding the health of the animals, together with a nominal roll showing all ranks and copy of order authorizing the move.

Instructions will be issued to the men as to where they

are to stow their kits, rifles, saddlery, ammunition, etc., and then they will be told off to messes, portions of the unit being kept together as far as possible. The troops then embark by the nearest gangway to their quarters. As soon as all are on board, the men will be directed to stand to their mess-tables, and police will be stationed on gangways to prevent movement about the ship.

When all are paraded to their messes, a Final Inspecting Board will examine the ship. The Board will consist of similar officials to those mentioned before.

They will see that the arrangements for berthing the troops have been carried out, and that the accommodation is sufficient. The O.C. troops on board will accompany the Board on its tour of inspection. During this inspection the Company Commander will read the ship's orders to the men, instructing them what to do in case of alarm, orders *re* lights, deck hours, etc. They will report to the Board, as it passes through the respective messes, that they have done so. The Board will report the result of their inspection to the proper authorities.

In order to insure smoothness in embarking troops, every unit should detail an advanced party consisting of an Officer to represent the O.C., Quartermaster, Transport Officer, and an Armourer and one other N.C.O. to obtain instructions regarding the accommodation, etc. The baggage and transport of the unit should be sent ahead where possible, but must not enter the dock area before the time appointed in their instructions, or they will cause confusion with other embarking troops. A baggage guard should be detailed to accompany the baggage, as well as the transport personnel.

All baggage must be plainly marked with the number, rank, and name of the owner, and where for cabin use, should not be of greater dimensions than 3 feet by 2 feet by 14 inches. Baggage must not exceed 5 cubic feet per cwt.

or be more than 30 feet dimensions, or more than 6 cwt. in weight. Explosive or combustible articles must not be placed in baggage. The baggage will be slung on board under the direction of the ship's officers.

As soon as the troops arrive, they must be instructed to fix their bayonets on rifles, removing frog and sling, which will be placed with remainder of accoutrements. The rifle should have a label gummed on the heel of the butt in order to facilitate identification later. The rifles are then placed in an armoury under the direction of a ship's officer, along with all ammunition. The key of the armoury is then handed to a selected military Officer, who will retain possession throughout the voyage. Where no armoury exists, the rifles will be stored in racks on the mess decks, and responsible N.C.O.'s placed in charge.

The kit-bags of the troops will invariably be placed in the hammock racks, or may be stored in suitable quarters in the hold. If the latter plan is adopted, they should be available during the voyage at stated hours in order to provide the men with changes of clothing.

Prisoners undergoing detention should be embarked under guard, and immediately placed in the guard detention quarters.

Ship's police, cooks, and bakers where necessary, orderlies, and fatigue duties, should be told off, and should immediately take up their posts.

Where necessary the men will be directed to parade for issue of hammocks and mess utensils, these being issued by messes on receipt.

As soon as the circumstances permit, boat-parties, fire-stations, and other emergency posts will be defined, and troops paraded on them to see that they are acquainted with their stations.

The Commanding Officer will meanwhile approach the

master of the ship and obtain his instructions regarding regulations as to lights, smoking, hours on deck, duties required, etc., upon which he will issue his own instructions. He will also obtain the key of a safe for protection of valuables, which will be returned to the master when leaving the ship.

During the period of the voyage, the C.O. will endeavour to carry out all orders issued by the master of the ship; and whilst the C.O. is responsible for the discipline, etc., of the troops, he must remember that the master of the ship is responsible for the safety, management, etc., of all on board.

All orders to the troops will be given through him, except when there is a Naval Transport Officer on board, when he will act as intermediary between the master of the vessel and the O.C. troops.

During the voyage a regular routine of duties, exercises, parades, etc., will be established, and at frequent intervals the troops will be practised in emergency drill, arrangements being made with the consent of the master of the vessel. As far as possible, the routine will conform to the ordinary routine of barracks. Orderly Officers will be appointed to accompany the Captain of the ship on his daily tour of inspection, and to take necessary action in any matter which he may direct to be attended to.

As soon as the vessel is fully loaded, the vessel is navigated from the port by the ship's officers. Immediately the vessel leaves port, the contents of the vessel is cabled to the Military Landing Officer at the port of destination, so that he is prepared for the reception of the vessel.

In allotting the tonnage of vessels, a rough estimate of the accommodation needed can be gained by allowing 4 tons per man and 12 tons per animal for ocean voyages, and 2 tons per man and 8 tons per animal for short voyages. The gross tonnage of a vessel is the total cubic space below deck and

the total cubic space of all closed spaces above deck. Net tonnage is the tonnage left after deducting the unavailable space for freight, engine-rooms, crew's quarters, coal-bunkers, etc. Freight tonnage is a measure of cubic capacity, a freight ton being 40 cubic feet of cargo space.

For ocean voyages this method of calculating tonnage is based on the assumption that the vessel is fitted for the carriage of troops and animals as a troopship.

In the carriage of vehicles, gun-carriages, etc., the gross tonnage is not so sure a guide, since the decks may have a lot of waste space, due to the fact that the holds are much higher than the height of the vehicles, whilst the floor space does not permit a greater number of vehicles being embarked.

In loading stores, etc., the goods are brought to the dock area, usually by rail, when the labour for unloading the trucks may be provided by the Administrative Service concerned or by dock labour companies. The labour of unloading trucks, filling slings, and again unloading slings, is provided by the Military Authorities, whilst the operation of the derricks, donkey engines, and stowage of cargo, is carried out by the Naval personnel.

When inspecting ships for use as freight-ships, care must be exhibited to see that the hatches are clear, derricks workable, and that lighting for night work is provided. Derricks should be capable of lifting 10 tons.

Vehicles are usually loaded on to the vessels with their loads complete, and the height of the load should not exceed 8 feet 6 inches above the ground, the poles being lashed underneath. Wagons are slung on board by means of a four-chain sling, one chain being fastened to the four wheels. Limbers may be slung on board by hooking to the trail eye. Care must be taken to avoid jars when landing the vehicles.

Articles that are required first on landing should be the last to be loaded into the vessel.

When ships are to be used as transports for animals, the stalls should be prepared and the deck covered with coir mats or straw. A supply of corn sacks will be provided, to be filled with straw as pads to protect the horses on board. Slings for use during the voyage will also be provided, to be used when needed. The gangway should be covered and have a gentle slope. Box stalls for sick animals should be arranged.

When loading, 5 per cent. of the stalls should be left to allow the horses to be moved. The boarding of the floors should be raised to allow drainage into the scuppers, the deck being levelled to avoid strain on the horse when standing.

Before embarking the animals, they should be given a feed of corn, and watered, a supply of hay being given as soon as they are embarked. They should have previously been shod fore and hind. On arrival at the ship side, the animals will be led on board in quick succession, the quiet horses being taken first. The men should avoid staring in the horse's face, but should walk straight ahead in a quiet manner. Balky horses should be hustled on board by men joining hands around their quarters. Before embarking, saddlery should be loosened and the ship's halter put on, the saddlery being carried on board and stored as directed. As each horse arrives at its stall, it will be secured and the bar placed. Kickers should be placed in corner stalls. The horse's head should be tied rather short at first, being loosened as he becomes reconciled to his quarters. When it is necessary to place a horse in slings, the hammock should be placed 3 or 4 inches below the horse's belly, so that he can rest in it when desired.

If it is necessary to sling horses on board, they should be watered and fed at least two hours before embarking. A party of one Officer and six men should be detailed to lead horses to their stalls as they are landed on the deck.

During the voyage the greatest care must be taken in hand-rubbing the horse or animal, and in sponging the eyes and nostrils with clean sea-water. Where possible, the horses should be exercised on deck, or they should be removed to spare stalls periodically. The daily rubbing and sponging should be carefully supervised, to see that it is properly done. Ventilation of the decks is of the greatest importance. Cinders should be placed under the horse's feet, to give him a grip on the deck. The greatest care must be taken in regard to the cleanliness of the horse decks, dung being carried away in buckets and dumped overboard at the proper scuppers. The scuppers will be kept clear and freely flushed. The horses should be watered regularly, and given at least 8 gallons *per diem*.

As soon as all vessels carrying personnel, animals, or stores depart from the Home port, the contents of the vessel is notified to the Military Landing Officer by cable. On arrival at the Overseas port, the Military Landing Officer will be aware of the contents of the vessel, and will visit the ship in the tender. He will give any orders that may be necessary regarding disembarkation, and no soldier or article may be landed without his consent. The order of despatch from the Home port will be regulated according to the instructions cabled by the I.G.C., and the precedence of landing will be fixed by him in the instructions which he will issue to the M.L.O. through the Base Commandant. The order in which the vessels are to be docked will be notified by the M.L.O. to the N.T.O., who will berth the ship at the dock agreed upon, but before doing so will ascertain whether the M.L.O. is ready for the reception of the vessel.

On the arrival of the troops, the M.L.O., who is distinguished by a red band worn on the upper left arm with the letters M.L.O. inscribed thereon, will issue orders as to time

and place of disembarkation, place of concentration, and orders as to destination, in accordance with the instructions which he has received through the Base Commandant. He will obtain from the Officer Commanding the troops a state showing the strength in men, animals, and transport, and also a nominal roll of all on board. He will also procure and pass to the proper authorities a medical certificate and a veterinary certificate, showing the freedom from infectious diseases of men and animals.

Upon receipt of the orders, the Commanding Officer will cause the rifles, ammunition, and kit-bags to be issued to the men, and will see that before the vessel is evacuated the decks and messes are properly cleaned up.

He will usually detail a rear party to clean up any mess left by the departing troops, and will either accompany the master himself or detail an Officer to do so, to make an inspection and see that all is satisfactory. He will cause all hammocks, mess utensils, and other ship's equipment, to be returned, and obtain a receipt for same. He will detail the necessary fatigues to assist in the unloading of baggage, transport, and animals. Where troops are landed and a march is necessary to arrive at their camp, he will see that rations and water are carried to meet requirements. As soon as all arrangements are completed, the troops will be moved off first, the fatigues unloading the baggage, etc. The horses will usually be left until the last. As soon as the animals are landed, they should be examined by a veterinary officer. If the journey has been long, the dock should be covered with straw, in case any animal should fall owing to the long period of inactivity. Horses should be worked easily until they regain their strength. As soon as the troops are all clear, the O.C. will report to the senior Officer at the port, and ascertain if all is satisfactory, making any adjustments necessary.

When stores of any kind are to be landed from a freight-ship, the order in which they are to be docked will be fixed by the M.L.O. according to his instructions. The Base Commandant will notify the Administrative Service concerned, who will either supply the necessary personnel and transport for unloading, or take steps to procure same from the labour units and transport services. Instructions in regard to the supply of extra personnel or transport will be issued by the Base Commandant. The stores will then be taken to the depot of the service concerned, or may be transhipped by rail under their direction.

Arrangements for unloading materials to be returned to the Home bases, or for the evacuation of wounded by hospital ships, are carried out in a similar way. The I.G.C. is notified as to requirements, and through the M.L.O. the necessary shipping is provided. In the case of the medical service, the Director of Medical Services, through his local representative, arranges for the necessary medical personnel and for the medical equipment of the ship allotted to him, and through the Base Commandant arranges for the embarkation. The number carried is reported on an Embarkation State which is handed to the M.L.O. by the Senior Medical Officer, and this information is cabled to the Home port for their information. In regard to the care of the sick and wounded, the Medical Officer is in charge, but otherwise conforms to all the rules of the Naval Transport Services. The use of outgoing ships for medical service is arranged in similar way, walking cases being usually placed on ships chartered for mixed purposes.

When the Commander-in-Chief desires to re-embark any portion of his force for operations in another part of the theatre of operations, he follows a similar procedure, the M.L.O. arranging for the allotment of vessels through the local representative of the Director of Sea Transport, and

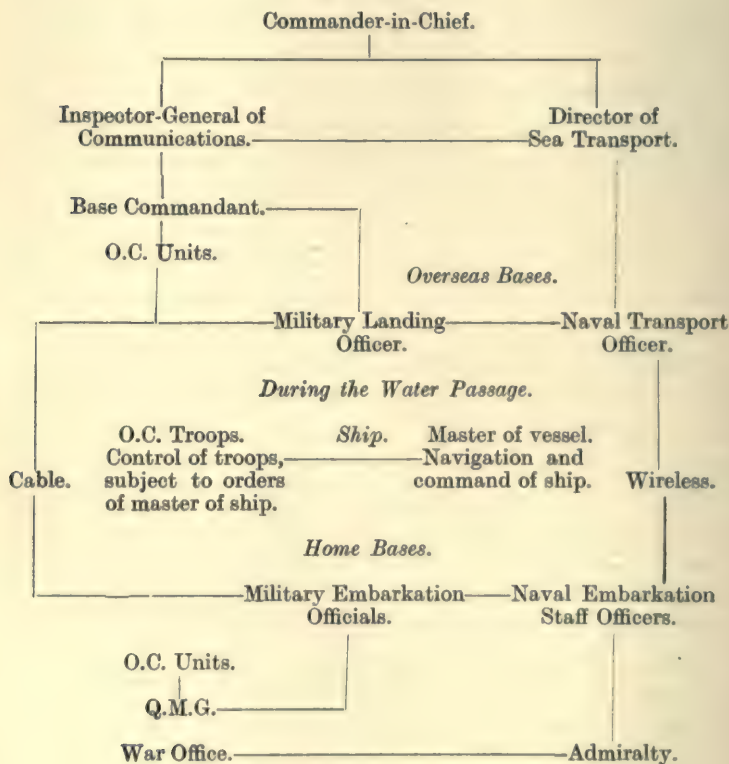
supervising the embarkation under the direction of the Base Commandant.

When vessels are carrying troops, a reserve supply of fifteen days' rations must be carried, over and above the quantity normally required for the voyage.

In providing vessels for landing, the Naval Authorities are responsible that an adequate number of boats, rafts, etc., are available, for which purpose the number of protective vessels may be increased.

Where the naval personnel is insufficient for the duties on a vessel, the master may demand the assistance of military labour.

PLATE XVII.—DIRECTION AND CONTROL MOVEMENTS
BY SEA.



CHAPTER IX

MOVEMENT OF TROOPS AND STORES BY RAIL

Railway Transport Service—Operation of Railways—Railway Transport Officers—Allotment of Regular Tonnage—Special Tonnage—Entraining—Responsibility while Travelling—Detraining—Loading and Unloading.

THE Director of Railway Transport is responsible for the operation of all railways utilized for military purposes, and for all matters connected with their efficient working. He is attached to the Staff of the I.G.C., from whom he receives orders as to the requirements of the forces, and with whom he makes arrangements regarding the co-ordination of other troops' and services' movements.

His railways are divided into sections, corresponding usually to the defence and administrative sections, and to posts as represented by important stations and junctions. At each of these sections or posts there would be a representative of the Director of Railway Transport who would supervise all matters under his direction.

At each station used for entraining troops or stores, and all detraining points, there would be an Officer appointed, who is called a Railway Transport Officer, who is distinguished by a red armlet worn on the left upper arm, bearing the letters "R.T.O." This Officer acts as intermediary between the troops and the Railway Transport Department, and is responsible for the direction of the troops within the area of the station.

Railways may be operated under several different conditions. They may be operated entirely by military personnel, or they may be operated by the Civil Administration under the supervision and control of the Military Authorities, or they may be operated under the direction, control, and partial working of the Military Authorities, assisted by civil labour.

The circumstances which compel the complete working by the troops are usually those of marked hostility and unreliability of the civil population.

Where the people are reliable, the railways would be controlled as far as precedence of traffic, and usually the control of telegraph services, is concerned, the Civil Administration supplying the labour.

Occasionally the increase of traffic, shortage of available labour, or extension of the lines, may necessitate the provision of extra military labour to assist in the operation of the railway.

A railway is a highly sensitive machine, and is easily rendered unworkable by undue interference and mismanagement, and it is therefore extremely important that only competent persons should be placed in control of the railways, who must be supported with every authority. The Railway Transport Service consists of trained railway experts, and the various officials are paramount in their authority in regard to the operation of the railways and railway telegraph service.

The I.G.C. is responsible for the working of the Administrative Services, and has complete charge of all matters relating to the administration and control of the lines of communication, but he will rarely interfere with the working of such intricate systems as those of railways. The G.O.C. Defences lines of communication is responsible for the defence of the railways, and likewise will refrain from interfering with the operation.

As the troops advance, the railways will be extended and repaired, for which purpose the D.R.T. is provided with the necessary railway construction companies and equipment from the R.E. Subject to the instructions of the Commander-in-Chief, as transmitted through the I.G.C., he will see that the railways are rendered tactically safe, and all stations, plant, and rolling stock, are turned into effective use at the earliest possible moment.

Where additional labour is necessary for this purpose, extra Engineer units and Signal Service units may be temporarily placed under his command. Civilian labour will be used for all tasks not requiring skilled labour, as well as for the operation of the railways where the Civil Administration has been retained. Where sufficient unskilled labour cannot be procured from civilian sources, additional labour may be procured from the G.O.C. Defences, by arrangement through the I.G.C., provided the defence is not imperilled thereby.

The Telegraph Signal Service will be operated by the Army Signal Service, for which purpose the necessary Signal units will be allotted for the exclusive use of the railway. They will then be under the direct orders of the D.R.T.

The duties of the Railway Service may be summed up as follows:

1. To be the intermediaries between the army and the technical administration of the railway.
2. To see that the ordinary working of the railway is carried out in such a manner as to insure the greatest military efficiency.
3. To see, on the other hand, that the demands of the army on the railway, which must always be directed through the Railway Transport Establishment,

are subject to military exigencies, so regulated as not to disorganize the working of the railway system as a whole.

Where the railway is operated by the Civil Administration, they act as advisers to the civil officials, who would not be able to gauge the importance of the various classes of traffic, and consequently might not be able to successfully meet requirements. At the same time, the smooth working and the proper use of the railway are assured by having a military control.

Where the demands of the troops cannot be met, the D.R.T. will report the circumstances, through the I.G.C., to the Commander-in-Chief, who will issue instructions as to the order in which demands will be met.

In operating a railway, the personnel may be grouped under two headings—namely:

Technical Personnel, which deals with the construction, maintenance, working, and repair of all railways in the theatre of operations, and—

Railway Transport Establishments, which control the arrangements between the army and the technical railway personnel for the transport of troops, stores, etc., by rail.

Both Staffs will be under the direction of the D.R.T. and his local representatives in any area. The Technical Staff is usually provided by the civil population, whilst the control is entirely vested in the Military Authorities.

The duties of the technical personnel are grouped under four main headings:

Management, which includes records of traffic, receipt and despatch of stores, etc., tracing traffic, loading and unloading, marshalling traffic, preparation of time-tables, despatch of trains, working of all stations and signal telegraphs, and the discipline and administration of all traffic personnel.

Train Operation, which includes the construction of rolling stock and machinery in workshops, and other plants; the provision and working of locomotives in accordance with traffic arrangements; and the administration of all personnel engaged in these duties.

Engineering, which includes the survey, construction, and maintenance of the permanent way and all apparatus other than the actual rolling stock, and the administration and control of personnel engaged in the work.

Accounting, which includes the accounting of all receipts in money, expenditures, and statistics of traffic.

For the better supervision of the railway working, these several branches may be placed under qualified officials, all of whom will account for their departments to the D.R.T. through a general manager.

The movement of stores by rail will be made automatic as far as the circumstances will allow, for which purpose the I.G.C. will allot a proportion of rolling stock to each of the Administrative Services, according to their possible requirements. These allotments will be distributed to the various depots according to their needs. When traffic is allotted, the representatives of the services are responsible that the vehicles are kept in operation, and are not allowed to lie idle waiting for personnel to unload, etc.

Additional traffic will be indented for, and the local representative of the I.G.C. will fix the order of precedence in accordance with the instructions he has received from his superior, and with due regard to the urgency of the traffic and vehicles available.

As far as the circumstances will permit, the movement of troops will be provided for in a similar way, but it will be inevitable that there will be urgent demands for rolling stock to meet some special requirements from time to time. As far as possible, the Commander of the force which it is

desired to move by rail will give early intimation as to his requirements, in order that the necessary traffic may be concentrated. Under some circumstances it may be imperative that normal traffic should be interrupted in order to provide the necessary transport under urgent conditions.

Where an allotment of traffic has been made to a service or to a body of troops, the requirements of each day may be notified to the R.T.O., who may make the arrangements. Twenty-four hours' notice is usually sufficient for this purpose. Where, however, the tonnage exceeds the allotment made, reference must be made, by telegraph if urgent, to the D.R.T., who will obtain the directions of the I.G.C. as to the necessary steps, advising him as to ability to grant same. Any abnormal demands for traffic will usually be notified to the I.G.C. by the Commander of the force concerned, as much time as the circumstances will permit being allowed for concentration. The "Q" branch of the Staff is responsible for perfecting the arrangements between the railway staff and the formations.

The use of the railway for short journeys rarely compensates for the loss of time in loading, since the troops can usually be marched in much quicker time. As an illustration, the time needed to move a division 60 miles by rail on a double track is equal to the time it would take the division to move by road, and where the tracks are confined to one line, an increase of 30 per cent. must be made. A division requires 100 trains, with a total of about 2,400 trucks and carriages, which are made up into 24 different types of trains. Assuming that the facilities for shunting and marshalling trains, and for loading and unloading at starting-point and destination, were very good, no time would be gained within these limits; but it is rarely that in a campaign the feat could be accomplished as quickly as the troops could be marched that distance. In the meanwhile, the

trucks used would be occupied and would not be available for other purposes.

When moving troops by rail, it is important to consider the facilities available for loading and unloading. It is better to move the troops in formations as large as a division a distance of 40 miles by road from a station having good facilities for unloading than to attempt to detrain them at a wayside station, where the operation would take more time than the force could have moved by road.

Trains for troops are usually made up in standard types. Where definite formations are to be entrained, a table of trucks is provided, so that a glance will indicate to the Railway Establishment the composition of the train.

Units should be entrained as complete as possible, and where they must be broken up, component parts should be taken as a whole.

Provision must be made at or near the station for parks, in which transports are to be assembled and troops formed up. These parks and assembly-grounds should be located so that there will be no congestion of traffic when entraining. Troops must move in one direction only. Ramps may have to be provided for loading vehicles, and all arrangements should be made before the troops arrive at the station. A time-table showing the composition of trains and the troops and animals they are to carry should be prepared by the R.T.O., for which purpose he should be given a Parade State showing the number of Officers and other ranks, animals, two or four wheeled vehicles, guns, limbers, bridging trains, etc.

Having completed these preparations, the R.T.O. will send a table of movement to the "Q" branch of the Staff concerned. This table should show the following information:

1. Unit to be entrained.
2. Time at which loading can be commenced.

3. Place of assembly.
4. Approach to the station.
5. Siding allotted to unit.
6. Hour of departure of train.
7. Halts on journey for rest or refreshment.
8. Provision of rations or water on journey.
9. Orders *re* station guards, picquets, fatigues, general control.
10. Special instructions regarding reports, etc.

The Staff concerned will then issue orders to the respective Commanders, quoting as much of the above as are applicable to the units or formations concerned.

Each unit should detail an advance-party to proceed to the station, consisting of an Officer representing the O.C., Quartermaster, and Transport Officer, and an Officer in charge of the working-parties. Transport should be taken with the advance-party if possible, and animals and transport should be loaded before the arrival of the troops. The Officer representing the O.C. will present the R.T.O. with a Parade State and copy of order to move. The transport and troops will be assembled in the area allotted, and as soon as the station is reported ready, they will be moved to the train by the prescribed route. Sentries should be posted over refreshment-bars, latrines, etc., and over watering-places. No water should be used on any railway establishment unless specially assigned for the use of troops or animals. Latrine accommodation should be dug in the assembly-grounds, if a lengthy wait is necessary.

Extra drivers being detailed to animals, each driver should lead his own horses into the cars. Balky animals should be hustled in by men joining arms behind them. In leading animals into the train, the troops should avoid staring into the horse's face. Except where otherwise ordered, horses

will be entrained saddled, or harnessed, the bits being removed, girths loosened, and stirrups or traces fastened up. Horses may be loaded with heads to the loading platforms, one horse going to the right and the next one to the left, or they may be placed head to tail alternately. The horses will travel much quieter if packed tightly. Heads will be left free, and a bar placed across to keep them from moving. The men should travel with their own horses. If the horses are to be fed *en route*, they should be placed with heads to platform, nosebags being filled during the journey. Hay and forage should be loaded separately in rear of train as a precaution against fire. The troops load their own animals.

Wagons, gun-carriages, etc., should be entrained fully equipped. They should be packed to economize room, but should be able to be unloaded quickly. Vehicles must be securely fastened to the truck, wheels being blocked, poles being secured beneath the wagons. Extra kits and baggage may be stowed beneath the wagons if necessary.

In entraining troops, the troops should be marched on to the platform in fours, blank files being filled up. They should then be given the order to turn toward the train "in fours," and, starting from the front of the train, each two sections of fours should be instructed to lead into the carriages, each man carrying his own kit, thus placing eight in each carriage. Where Pullman carriages are used, they may lead on to the platform in double ranks and be ordered to file into the cars. Strict control must be kept over the men, sentries being placed over all bars, latrines, and watering-places. The men must be warned that they are not to leave the carriage when once entrained until arrival at halting-places or destination, and only then on the word of command. Sentries should be detailed over each carriage to see that this order is obeyed. When halting at a rest or refreshment station, the troops should be instructed

that they are to fall in outside their carriages and wait further commands. At these stations the R.T.O. will give instructions as to the necessary steps to be taken.

On arrival at the detraining station, a responsible Officer will be detailed to interview the R.T.O. and obtain instructions. The R.T.O. will inform the officer as to the place of assembly, instruction as to unloading animals and transport, and communicate any orders as to next steps that may have been communicated to him.

Upon the order to detrain being given, the troops will fall in outside the train with full kit and equipment. The Orderly Officer and his assistants should make an inspection of the carriages to see that all equipment has been taken from the train. Meanwhile the troops should be moved at once to the assembly area, which should be picqueted to prevent the men straggling. Latrines should be dug if necessary. The transport will be unloaded, and as soon as completed the animals should be detrained and taken at once to their vehicles and hitched up.

The importance of troops keeping up to the time-table which has been prepared cannot be over-estimated. Delay may mean confusion throughout a lengthy period, since a train holding a line may hold all trains in rear of it. Everything depends upon the amount of co-operation that the Regimental and Staff Officers give the Railway Establishment, who should be unsparing in their efforts to assist.

There are a few provisions regarding troops travelling by rail which should be noted:

Parties of fifty should be under an Officer.

At all halts Officers will take their positions by the carriages containing their commands.

Under no circumstances may troops remove, or interfere with, any article belonging to the railway service.

Irrespective of the rank of the Commander, he must obey the directions of the R.T.O. in regard to the entrainment and detrainment of troops, animals, baggage, etc., but the discipline and control of the troops when actually travelling lies with the Commander.

Troops must not be allowed to loiter around any railway building or area, and should not be allowed to enter for entraining more than fifteen minutes before the time for entraining.

When issuing orders for entrainment, Commanders should put all details and regulations in an appendix which can be detached, and extra copies should be issued to all concerned.

When stores are to be shipped by rail, the service concerned is responsible for the necessary labour for loading, and for the transport to convey same to the area. Indents for railway tonnage will be made to the R.T.O. when the tonnage is part of the total allotted to the particular service for routine requirements, and through the I.G.C. for abnormal requirements. For unforeseen requirements of a small extent, arrangements may be made by the R.T.O., provided the available transport will permit, but the action must be reported to the I.G.C. The arrival of trains will be noted by the R.T.O., who will notify the Administrative Commandant of the post or section, in order that the service for whom the contents are intended may make arrangements for their reception, unloading, and removal.

At all stations where depots are situated, a regular system of transport and labour will be organized by the Administrative Service in order to cope with the railway traffic. Under no circumstances must trucks be delayed for lack of labour or transport to unload them.

A way-bill must accompany every consignment, the Army

Form being used for the purpose. The contents of each train are telegraphed to destination, truck numbers being given to facilitate shunting and unloading. Special identification marks may be used to indicate the trucks loaded with the different classes of stores.

As the trains are ready for shipment, the Railway Establishment at the station will notify the Officer in charge of their section regarding despatch, in order that the movement of trains may be co-ordinated with traffic from other points, the order of precedence as fixed by the I.G.C. being observed. On arrival at regulating stations, the trains are marshalled until advice is received from railhead that they are ready to receive them. As the railhead will often be selected by force of circumstances, and the accommodation which is offered is limited, it is especially important that there shall be no delay in clearing trains at that point.

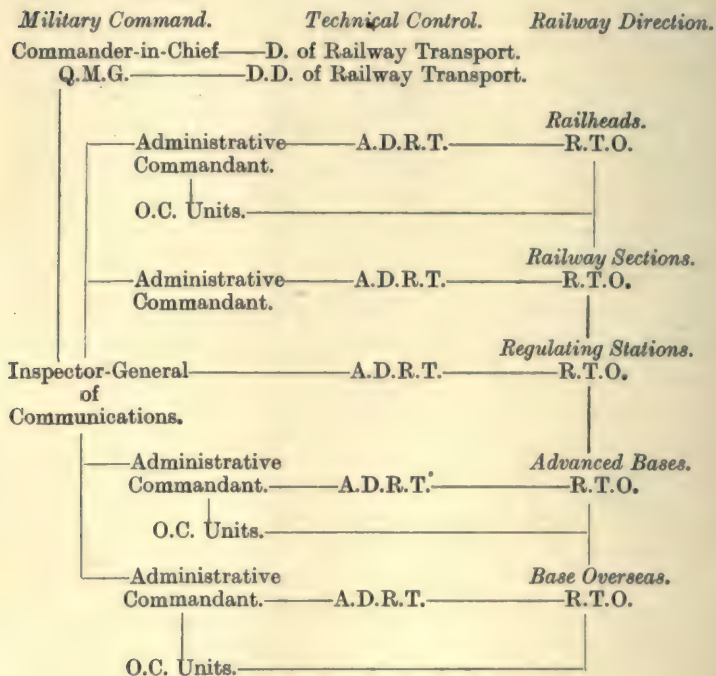
In accordance with the intentions of the Commander-in-Chief, the facilities of the railhead stations will be improved, special sidings laid, ramps constructed, etc., although, where the advance is likely to be continued, this may be delayed pending better accommodation elsewhere.

The operation of ambulance trains will be controlled by the Railway Establishment, who will consult with the Director of Medical Services as to possible requirements, and will arrange for the provision of the necessary transport, time-table of movement, etc.

Armoured trains allotted to the defence of the lines of communication will be under the control of the G.O.C. Defences, but in operating them, consideration must be given to the administration of the railways, and that Officer will be particularly careful that their employment does not interfere with or impede the general traffic. He will usually make arrangements with the D.R.T. in regard to the time of their movement, passing points for traffic, etc.

It must be ever remembered that a railway system such as is required by a military force of the size of the present armies is heavily taxed at all times, and demands made upon it should be very carefully considered. Apart from the military traffic, there is the civil traffic to be considered, and although arrangements for the latter are only made when all military requirements are met, it will be necessary to provide facilities for the movement of civil freight, etc. All ranks of every department must be particularly careful, therefore, that the rules laid down by the R.T. Establishment are closely followed, and that no variation of the timetable shall be caused from their default. It should be a standing motto that a railway is "out of bounds" to all ranks, except when duty demands encroachment, and that, when that is necessary, personal feelings must be subordinated to the needs of the Service.

PLATE VIII.—CHAIN OF RESPONSIBILITY FOR RAILWAY TRANSPORT.



NOTE.—For all normal traffic applications are made through the local Administrative Commandant to the local representative of the Railway Transport Service, who issues instructions to the R.T.O. Special requirements are forwarded to the I.G.C., who will communicate them direct to the D.R.T.

O.C. units arrange direct with the R.T.O. for entrainment of units or loading and unloading of stores.

CHAPTER X

ROAD TRANSPORT

Classes of—Types of Vehicles—Harness—Loads—Care of Animals—Mechanical Transport—System of Working—Indents—Traffic Control—Inland Water Transport.

THE Director of Transport is responsible for the provision of all transport, other than railway and sea transport, but including inland water transport, unless the latter is used to an extent sufficient to warrant the appointment of a separate Director for that purpose, and for the administration of the transport personnel. To assist him in his duties there is a representative attached to the various formations who represents him in that force. That the transport is allotted in a manner best calculated to meet all requirements, he is responsible to the I.G.C. In the field formations the duties of transport and supply are often combined under a representative of Transport and Supply.

The transport may be divided into three zones, as follows:

1. Transport allotted to field units to carry their immediate needs.
2. Transport connecting the field units with railhead.
3. Transport allotted to the lines of communication between railhead and the base.

The transport allotted to field units is divided into three classes:

First-Line Transport, which accompanies the troops

wherever they go, and which carries articles which are absolutely essential to their needs when engaging the enemy, as represented by guns, limbers, ammunition wagons, pack animals, tool and technical store wagons, medical carts, water-carts, telephone cable wagons, and field kitchens. In the case of Cavalry units which do not have trains, the first-line transport also carries supplies and baggage.

Second-Line Transport, referred to as the "Train," which carries articles not immediately needed when engaged with the enemy, such as baggage, supplies, and stores, but necessary for their subsistence.

First and second line transport is allotted to the fighting units (except the Cavalry, which has only first-line transport). The first-line transport accompanies the troops wherever they go, whilst the second-line transport is held back when battle is imminent, being placed in a safe place under escort until again required.

Administrative Transport is that allotted to administrative units, and is not subdivided when the troops march, such as the ambulances with the field ambulances.

Transport connecting the field units with railhead is divided into two parts, namely:

Corps and Army Transport, carrying the stores, etc., required to maintain the force, and operating under the direction of the field forces, and—

Lines of Communication Transport, moving between railhead and the rendezvous under the direction of the I.G.C., from which point it proceeds into the field of operations under the guidance of the field forces, returning to rendezvous when it again passes under the lines of communication control, and back to railhead. This transport is represented by the supply parks, reserve parks, etc.

Transport allotted to the lines of communication between railhead and the base will be provided as an auxiliary to the

railways. It is usually located at the points where the depots have been established, and is used for transport service between depots and railways.

Various types of vehicles are used, being governed by the conditions of the roads and the area in which the transport is to operate.

On good roads mechanical transport will be used, whilst on second-class roads horse transport will be substituted.

Mechanical transport may take the form of lorries, tractors, caterpillars, and motor-cars.

Horse transport may consist of light vehicles accompanying the forward troops, and capable of moving over any ground; or heavy transport, capable of moving at a walk only, and tied to roads in its operation.

Pack animals may be used where wheeled vehicles cannot go, as when climbing very steep grades or when operating close to enemy positions under observation.

The first-line transport, which accompanies the troops in the most forward position, consists of pack animals, carts, limber wagons, and, of course, guns and their carriages. The G.S. limber wagons are capable of being galloped over roads, and can negotiate any kind of ground over which a wheeled vehicle can pass. The construction of a limber wagon gives it the same elasticity as that of a cart, without the disadvantages which accompany the latter. The cart must be carefully loaded in order to distribute the weight, and even under the closest supervision it is difficult to prevent a strain being thrown on the animal, especially when going up and down hill. The limber wagon has the lightness of draught of the cart, the load is more stable, and is sufficiently elastic to permit its employment over the roughest kind of ground. In its construction the aim was to combine strength with lightness of draught. It is simple in build, easily repaired, and can be wheeled around in its own length.

It takes up less road space than two carts carrying the same load. Carts are still used for water, tools, and medical equipment, in order that they may be taken on roads too narrow for the negotiation of four-wheeled vehicles. The carts and limber wagons, therefore, accompany the most advanced troops on account of their extra mobility. The load they carry is limited, however, and they are of little value for bulky articles.

The G.S. wagon, used for slower moving transport, drawn by heavy draught animals, is more solid in its construction. The vehicle has a light draught with a front turn-table permitting a quarter turn, and is safe when tilted to a sharp angle from any fault in the road. It carries the bulkier materials required by an army, and since it moves in the rear or train of the fighting troops, it can maintain a slower, steady pace without hindering the mobile force.

Poles are used in place of shafts in all limber and G.S. wagons, as they are easier on the horses when going downhill, distributing the strain evenly amongst the teams; it is easier to change teams if necessary, and fallen horses may be more readily extricated.

Breast harness is largely used, because of the ease with which it can be adapted to any change in the horse's condition, whereas with neck collars a horse losing flesh might be badly fitted, and consequently gall-sores would result. The collar gives better results as far as the effort which the horse can put into its work; but as loss of condition is inevitable when a horse is submitted to steady work on active service conditions, combined with existence in the open, the breast harness is more suitable to war service.

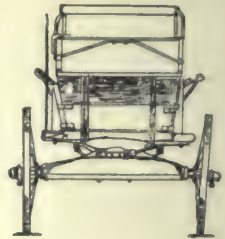
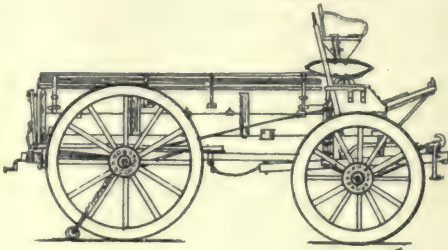
Pack animals are fitted with a pack saddle distributing the load on each side of the animal. The load may be suspended from hanging bars and secured with a baggage rope. Protection is given to the sides of the animal by specially

TYPES OF ARMY VEHICLES.

SCALE 1/32

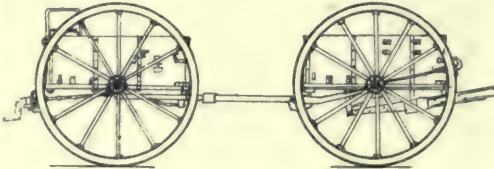
GENERAL SERVICE (G S) WAGON.

LOAD 3000 Lbs.



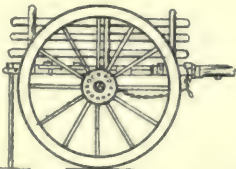
GEN. SERV. LIMBER WAGON.

LOAD 2000 Lbs.



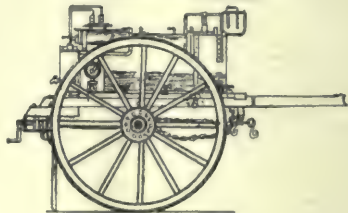
MALTESE CART.

LOAD 1500 Lbs

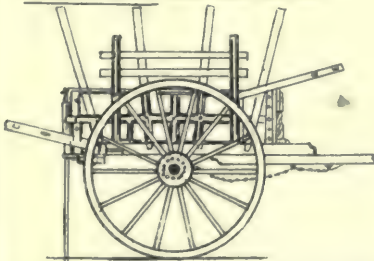


WATER FILTER CART.

CAPACITY 115 GALLONS.



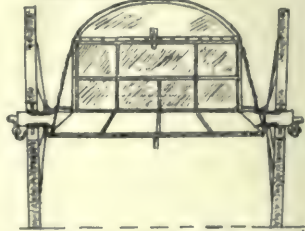
FORAGE CART. LOAD 1200-1800 Lbs



S. A. A. CART.

LOAD 16000

Rds.



SPRINGS

constructed panels or by wooden bars. The saddle is secured to the animal by means of a breast collar, breeching, and crupper.

In tropical countries use is made of camels, yaks, and elephants. Camels and elephants are fitted with pack-saddles, and elephants and yaks are used for wheeled vehicles. We shall not deal with these animals in our lecture, since they are restricted in use to certain areas, which have many deviations in equipment, etc.

Horses are classified as draught and heavy draught animals. The draught horse should be capable of drawing a load of 1,800 pounds for a distance of 20 miles per day. He should be able to walk about 3 miles per hour and trot at an average of 6 miles per hour. When employed as a pack animal, he should be capable of carrying a load of 200 pounds at a rate of 3 miles per hour. Horses are too expensive, cost too much to feed, and their height makes him difficult to load for employment on pack duty.

The mule is a very hardy animal, stands thirst and heavy work, and whilst good fare is necessary to keep him fit, he is not dainty in regard to food. He needs training to make him used to fire, as he is liable to stampede. He can carry a load of about 160 pounds at a rate of 3 miles per hour.

The other animals sometimes employed for pack work have a capacity as follows:

Donkeys	can carry	100	pounds	at a rate of	2½	miles	per hour.
Bullocks	„	200	„	„	2	„	„
Camels	„	320	„	„	2½	„	„
Elephants	„	1,000	„	„	3½	„	„

Carriers are sometimes used, generally in tropical countries, but are very unreliable. They are usually natives, and are likely to become panic-stricken and stampede in emergency. They are organized into companies of 25 to 50 men, under a headman or ganger, which are grouped into

a corps of 500 under a British Officer and N.C.O. Special identity discs are issued to assist in keeping record, etc. They carry a load of 40 to 50 pounds. The Chinese carriers carry a load of 80 pounds distributed at each end of a pole carried on the shoulders.

The loads that can be carried on the various types of horse transport are as follows: Limber wagons, about 20 cwt.; G.S. wagons, about 30 cwt.; carts, about 15 cwt.

The wheel spaces of all vehicles except pontoon wagons and ambulances is 5 feet 2 inches. Both front and rear wheels have the same space, thus reducing the resistance.

O.C. units are responsible for the condition of the transport and animals in their charge. Transport Officers are employed in most regimental units, who look after the personnel and who are responsible to their O.C. for the care given to the transport equipment.

In the care of animals, particular attention must be paid to the provision of sufficient concentrated food, such as grain, to give the required strength, with enough bulky food, such as hay, to enable the digestive system to operate freely. The Government forage rations are based on the studied needs of an animal working under active conditions, but frequently resort must be made to local supplies, in which case suitable substitutes must be found. Changes in diet are to be carefully brought about. The new rations should be gradually introduced along with a proportion of the old rations, in order to accustom the stomach to the change. Salt should be supplied, otherwise the animal will lick the ground, with injurious results, in the attempt to supply the deficiency. Horses should be watered freely, or the results will be similar to that found from loss of food. Horses rarely drink during hours of darkness; therefore they should be watered during the daylight hours. Donkeys and mules are treated the same as horses.

In the care of harness, particular attention must be paid to the fitting, and frequent inspections should be made to see that the harness fits snugly to the animal. The loss of condition before referred to makes this necessary. The leather of the harness is apt to perish on active service, unless it is carefully looked after. The leather should be dubbed frequently, except in the case of those parts which are to be kept stiff, such as the panels of saddles, etc. The inner surface of leather which is in contact with the flesh of the animal should be examined to see that there are no lumps to irritate the animal. Stitching should be watched to prevent breakage, and all metal portions examined to see that they are sound. The padding of harness should be periodically inspected to see that it has not become insufficient or lumpy.

A Commanding Officer should hold inspections from time to time to see that these rules are being observed. The Transport Officer with the formation will hold inspections at irregular intervals, and call attention to any matters needing adjustment.

The mechanical transport has advantages over the horse-drawn transport in so far as carrying capacity is concerned. It takes up less road space for the size of the load than that taken up by horse vehicles, moves at a faster pace, and can cover a longer journey without the exhaustion that animal labour involves. It is confined in its area to good roads, however, and where a breakdown of supply occurs, difficulty may be experienced in getting local fuel to operate the transport.

Tractors have many advantages over lorries and other vehicles having their motive power as a part of the carrying vehicle. The tractor can be used to draw a load, and during the time it is being unloaded the motive power can be withdrawn to other duties. In the event of the ground being

bad, the tractor may draw to one side to secure firmer footing, when it may draw its loads clear to solid ground. They can draw one or more trucks behind them, and usually have a greater power than lorries. Their chief disadvantage lies in the fact that they can carry but a limited supply of fuel and water, consequently their radius of action is limited. They require 1.5 pounds of coal per ton mile for heavy tractors, and 2 pounds for light tractors, while the former must refill water-tanks every 10 to 12 miles, and the latter every 15 to 20 miles. Traction steam engines have a hauling power of from 12 to 18 tons using three or four trailer trucks, and a speed of $3\frac{1}{2}$ miles per hour. Light tractors have a hauling capacity of from 4 to 6 tons, using from one to two trucks or three trailers, and a speed of 5 miles per hour. Five small tractors with trains or five steam lorries with trailers are roughly the equivalent of two traction engines with their trucks.

Steam lorries can haul from 3 to 5 tons, using one trailer, at a pace of 5 miles per hour. Each trailer used with these vehicles carries about $1\frac{1}{2}$ to 2 tons.

Lorries have the advantage of pace over the tractors, and can cover greater distances without replenishing fuel-tanks. The internal combustion engine lorries can travel from 50 to 100 miles without refilling tanks. They have a hauling capacity of from 30 cwt. to 5 tons, the standard types hauling 30 cwt. and 3 tons. They have a speed of from 7 to 12 miles per hour.

Motor trucks carry from 4 to 6 tons with a speed varying in accordance with their construction.

Provision must be made for artificers where motor or steam vehicles are used.

When calculating the road space occupied by M.T., an allowance of 100 yards per vehicle must be allowed when moving at full speed.

The transport allotted to the field units is fixed in accordance with their War Establishments. The maximum load of equipment, baggage, etc., is estimated, and the necessary transport provided. The movement of the transport is regulated by the formations to which the units belong. Regimental units carry their transport with them, parking their train transport when going into action, the first-line transport accompanying the troops.

The administrative units employ their transport in carrying out their duties behind the fighting forces, sending up the stores, ammunition, etc., which are needed, and transferring same into the first-line transport of the unit, which carries it forward. The administrative units then return their transport to the refilling points selected by the Commander, or such Officers as he may delegate that power to, where they come into contact with the third-line, or Corps and Army Transport. This transport is formed under various establishments, according to the duty it has to perform, and usually consists of mechanical transport. This transport will be the connecting-link between the railhead, or between any units inserted between railhead and the fighting forces. Supply columns, ammunition parks, motor ambulance convoys, etc., are found in this echelon. The third echelon may be placed under the I.G.C., in which case he regulates all movement of the transport.

The points at which the responsibility of the I.G.C. and G.O.C. Defences cease will be defined by the Commander-in-Chief, and up to that point the transport will be moved under his direction. From there on they are moved by the field Staffs. The "Q" branch of the Staff is responsible for the co-ordination of all movements, and issues the necessary orders for the establishment of refilling points and for the provision of escorts, seeking the order of the "G" branch in regard to the latter. Upon the return of

the transport to the rendezvous, the responsibility again passes to the lines of communication authorities.

Deficiencies in transport, other than the technical vehicles of the Engineers and Artillery and Flying Corps, are made up through the representative of the transport service with the formation in the field, the exceptions being made up through ordnance.

The transport on the lines of communication below rail-head is allotted to the different bases according to the needs, and is formed into companies. The transport thus distributed may be either mechanical or horse-drawn. Depots are established at these places under an Officer of the transport service, through whom all indents for transport are filled. These indents are made by the service requiring them direct to the depots if an allotment of transport has been made for their use, and in other circumstances, through the Base Commandant, who will issue orders as to whether same should be filled; and where a number of indents are received, he will fix the precedence in which they are to be supplied. Extra transport required for hauling stores from rail to depot and *vice versa* is allotted from these depots, the units supplying the necessary labour themselves for loading and unloading.

The depots form the reserve for the replacement of casualties in both the field and the lines of communication units, subject to such orders as may be given through the I.G.C.

Motor omnibus companies may be required to operate as either army, corps, or lines of communication troops for the conveyance of troops in the field. These omnibuses are formed into companies, and operate either under the direction of the field or lines of communication Staffs, according to which area they are employed in.

The personnel, animals, and transport of the transport services are supplied by the Army Service Corps, except

in the case of first-line transport, which is supplied from the establishment of the fighting units. Transport units, columns, and parks, are A.S.C. units, but move under the control of their respective services, the additional personnel for technical duties being supplied from those services under which the columns, parks, etc., are employed. Motor-cars for passenger traffic may be allotted as the circumstances demand, although these will usually be attached as a part of the establishment of the forces in the field. Extra cars may be parked under the transport service, however, and indented for as required.

The system of managing road transport is governed by the local conditions in regard to the tactical situation, the distance to be covered, and the length of time in which the distance between the field armies and the bases of supply remains unchanged. It will frequently happen that the railway facilities available do not present a favourable distribution in so far as they do not bring the railhead within reasonable daily journeys from the field force. Under these circumstances, the use of road transport to bridge the gap becomes necessary. Mechanical transport units have a range of 90 miles *per diem*, making a round trip; hence their radius of operation is limited to 45 miles in each direction. Whilst they are able to travel farther, it must be at the sacrifice of efficiency, owing to the loss of rest for the working crews. Horse transport is limited to 20 miles per day, which cannot be maintained without loss of condition to the animals. The distance to be bridged may often exceed the range of these figures; therefore a system of transport must be devised to give the crews and animals sufficient rest, whilst maintaining the daily service. There are three different systems adopted under these circumstances; they are known as the following: (1) Through convoys; (2) Staging system; (3) Meeting system.

The "Through" system consists of convoys which proceed direct to their destination, using the same vehicles and animals throughout, giving such halts as the distance renders necessary.

The "Staging" system is arranged by dividing the route into stages of one day's journey for the round trip, each convoy carrying its load to the end of the stage, depositing it there, and returning to its starting-point, repeating the process on the following day.

The "Meeting" system is a departure from the last system, where two convoys are detailed to bridge the total distance; each proceeds halfway to a rendezvous, and there transfers the load from the full to the empty wagons, returning to their respective stations, which would complete the day's journey.

The necessity of adequate escorts in each case must not be forgotten, and when the country through which convoys must pass is of such a nature as to render consolidation of the defence of the route impossible, it will be necessary to provide mobile escorts to safeguard the convoy. Mechanical transport is very difficult to protect owing to its speed, which outdistances the escort, and consequently it may frequently happen that from the tactical aspect the use of horse transport under one of these three systems is compulsory, even though the distance might have been bridged by mechanical transport in one day.

As a general rule the through convoy system is adopted in the area beyond advanced depots, whilst the staging and meeting systems are used in bridging gaps in the lines of communication.

Should a breakdown occur on the railway at any time, the I.G.C. will arrange with the D.T. for the provision of reserve transport companies to bridge temporary gaps in the railway lines, but every effort will be made to restore

traffic at the earliest possible moment, owing to the loss of tonnage which the use of road transport makes unavoidable.

The number of units inserted to maintain the system of supply from railhead to refilling points may have to be increased, and a system such as has been described inaugurated, when the distance from railhead is lengthened out beyond the daily journey of the existing establishment. These extra units would be taken from the lines of communication, and allotted either to the corps or army troops or to the transport of the lines of communication, beyond railhead.

The increase in the size of our armies has resulted in a corresponding increase in the amount of transport which it is necessary to concentrate in the areas occupied by the troops. As the forces are quartered in close areas for tactical security the congestion of roads is unavoidable, unless traffic is strictly controlled.

In making arrangements for traffic control, the "A" and "Q" branches of the Staff work in unison. The "A" branch is responsible for discipline and military regulations, and consequently it is by means of their machinery that the laws are enforced. The "Q" branch is responsible for transportation, supply, etc.; and, being conversant with the transport to be moved into the area occupied by the troops, will be able to confer with the "A" branch, and between them they prepare and issue orders for the guidance of troops.

In selecting routes for traffic the condition of roads must be considered, preference being given to the good roads for rapid-moving and mechanical transport. The number of roads available seriously affects the problem, but, as far as the conditions will permit, slow-moving horse transport is directed over a route by second-class roads, returning either by the same route or, if the number of roads will permit,

by another direction. The mechanical transport is similarly restricted to first-class roads, and where several are available within reasonable distances, they are sent in one direction along a road, returning by a circuit along another. The transport may be again subdivided, if sufficient roads are available, so that rapid-moving transport such as motor ambulances, ammunition units, etc., are moved over one road, supply and stores vehicles being moved over other roads.

All intersections must be policed and cross-overs avoided as far as possible, but when they exist they must be strictly controlled. The A.P.M. is responsible for carrying out the orders issued, for which purpose he employs his police, obtaining any extra assistance from the corps troops, Cavalry or Infantry, according to arrangements made by the "A" branch.

Orders for traffic control should be circulated freely, and in order to facilitate distribution they should be attached to orders as an appendix, additional copies being furnished to all units, which must be passed to Transport Officers, with orders that they be read on definite parades.

When the army occupies an area for a considerable period, it is of great assistance if notice-boards bearing conspicuous directions are posted at intersections, with arrows or hands pointing the route for the different classes of traffic. At night the roads should be marked by coloured lights, if the tactical situation permits their use.

As a general rule the advanced roads are controlled by the corps and army Staffs, each being responsible in a definite area, but co-operation with Divisional Police may be directed where necessary. In the vicinity of railheads and depots on the lines of communication the arrangements are made by the I.G.C., and orders issued through the local Commandants, who will revise the orders in regard to local conditions.

When troops are occupying quarters, the Regimental Officers are responsible that traffic is not allowed to stand on thoroughfares in such a position as to block the passage of troops and traffic, and where it is unavoidable that wagons must be left on roads, they must be drawn off to side streets and sentries posted over them, or lights left to guide traffic during darkness.

Inland water transport for the navigation of rivers, canals, and inland waterways, is usually employed for the conveyance of bulky materials which are not sufficiently urgent to require quicker modes of transport. For this reason the transport may be used to advantage in the conveyance of forage, hay, straw, timber, etc., and building material, which is routine in regard to issue, and which can be estimated sufficiently far in advance to allow the use of slower transport.

The Director of Transport is responsible for the operation of the Inland Water Service, except where used on a large scale, when a separate Director is appointed.

Like all Administrative Services on the lines of communication, it comes under the direction and control of the I.G.C.

The capacities of the various boats used will vary according to the extent of the waters navigated. Light-draught sailing vessels may be able to be used, in which case stores may be brought right up to advanced bases, or stores may be transferred lower down and be brought up by barges, either horse or tug drawn.

In England the capacity of the barges is as follows: A horse-drawn barge can take average load of 50 tons for one horse, covering 20 to 25 miles per day, at a rate of 2 to 2½ miles per hour. Tug-drawn barges have a capacity of 80 to 100 tons, and boats 30 to 50 tons, making a speed of 3 to 4 miles per hour.

The use of inland water transport for the evacuation of

sick and wounded is to be recommended owing to the smoothness of movement, and the spaciousness of barges fitted up as hospitals as compared to the limited area of the hospital train. Ambulances of a flotilla of six barges each are organized, the navigation being supervised by the I.W.T. Service, the care of the patients, of course, being left to the Medical Service.

The personnel of the service is supplied from the R.E., but civilian labour is used whenever possible.

CHAPTER XI

QUARTERS

Classes of—Distribution in—Billets—Duties when arranging—Precautions—Water-Supply—Bivouacs—Space required—Camps—General Duties in Quarters—Employment of Troops.

IN selecting quarters for the troops in the field, the first consideration must be that of security of the force, the second being the comfort of the troops. In regard to the first, the proximity of the enemy and the length of time required to get the troops on the move are the two important factors. In regard to the second point, the available accommodation must decide.

Quarters take the form of billets, close billets, bivouacs, and camps.

Billets are the usual quarters adopted in civilized countries. They have the advantage of giving proper rest and providing better cooking facilities than those obtained in other forms of accommodation, but have the serious disadvantage of causing a wide dispersion of the troops, with the consequent loss of tactical strength, apart from the difficulties of concentration and advance which the congestion of streets must produce. By adopting close billets this difficulty may sometimes be overcome, in which case every available space is occupied by troops: halls, staircases, etc., being utilized to give shelter. This system should only be adopted in very bad weather, since the opportunities for rest are not so great when troops are cramped in space.

Bivouacs are freely used in good weather, and possess the great tactical advantage of allowing troops to rest in battle formation. This method of resting troops is very trying, and should never be adopted except when the tactical conditions make it absolutely necessary.

Camps require preparation, for which the tactical conditions must be favourable. The camps may take the form of tents, huts, or permanent barracks. Where troops are engaged in siege warfare it is possible to build these, and to provide the necessary adjuncts in the way of water-supply, sanitary accommodation, etc. By the use of camps troops may be concentrated according to the needs of the situation.

We shall consider the steps necessary to bring troops into these quarters separately.

In taking up billets, the area to be occupied will depend on the size of the force, which may necessitate the distribution of the troops over many towns and villages. The extent to which the arrangements will be left to the smaller formations will depend upon the distance between the different areas. Usually the division will be allotted an area, which will be divided up by the Divisional Staff. In every case the Staff selecting quarters must be guided by the tactical requirements first. The troops who are to take the field in advance will be pushed forward into the most advanced billets, and each Commander will make his distributions accordingly. As an example, if a Corps Staff is arranging billets, the division which is to form the van of the army in advance will be placed in the most forward area. The division would then place its foremost brigade in position to take the field, and so this principle is followed down to the distribution within the regiment. The orders for the tactical distribution will emanate from the "G" branch of the Staff.

As soon as the tactical orders have been communicated

to the " Q " branch, that department will arrange the distribution in detail. From the map areas will be selected for the various formations, and communicated to the Staff Officers concerned. As a brigade group will usually be the largest formation that can be accommodated in one area, except in the case of large cities, the Staff Captain of the brigade will be responsible for the distribution in detail within that area. Following the instructions he receives, he will proceed to the area allotted to him, accompanied by an interpreter.

On arrival within the area he will proceed to the offices of the Civil Administration, where he will see the Senior Civil Authority. From him he will ascertain the amount of accommodation available, using the local knowledge of that official, and then he will make his distribution accordingly.

In estimating the capacity of an area for billeting troops without subsistence, it is estimated that accommodation can be provided at the rate of ten men per inhabitant in agricultural districts, and five to six men per inhabitant in town or industrial districts. Where subsistence has to be provided, these figures are reduced to about twice the population for a period of one week.

A requisition for billets is served upon the Senior Civil Official on A.F. 789, which will show the number of Officers and other ranks and animals to be billeted. The Civil Officials then issue orders to the inhabitants to provide accommodation according to their capacity. Where subsistence is demanded, the number of days' subsistence is stated upon the order form.

By this means the Civil Administration is used, and, as most European countries have prepared statistics as to available accommodation, much time is saved that would otherwise be spent in making personal reconnaissance.

From the data thus gathered, the Staff Captain will issue

distribution tables. By previous arrangements, billeting parties for each regimental unit will proceed to a rendezvous, where they receive their orders from the Staff Captain. When troops are advancing, orders for the advance-parties to join the protective troops in advance will usually be embodied in the orders for the march.

The regimental billeting party should consist of an Officer per unit, and one N.C.O. to represent each integral part of the unit, such as the company, squadron, etc. Sanitary details to look after the water-supply should also be included.

Upon receiving instructions from the Staff Captain, the Regimental Officer will proceed to the area allotted to him, and will divide it up into sections, allotting one to each part of his unit. The N.C.O. representing that part of the unit will then proceed to examine the buildings, assess their capacity, and mark upon the door in chalk the number of the unit and the number of men to be quartered. He should also arrange for water facilities, washing, cooking, etc., and, where time permits, for hot refreshments to be prepared for the men on arrival. This can only be accomplished if the field kitchens are used to prepare meals on the line of march. Where men are relieved from trench positions this can be done, as the transport will be waiting in rear. The N.C.O. should make every arrangement that can possibly be managed before the arrival of the troops. Whilst the N.C.O. is thus engaged, the Officer representing the unit will attend to other matters. In making his arrangements he should remember the following rules:

1. Staff Offices should be on main communications and easily found.
2. Mounted men must be near their horses and gunners near their guns. Staff Officers near their respective offices.

3. Both sides of a street must be utilized for one unit, in order that no confusion will arise in case of alarm.
4. Roads and communications must not be blocked.
5. Depots must be near good roads.
6. Staffs and hospitals have first claim on buildings.
7. Hospitals should have the most suitable buildings.
8. When shelter is limited, preference is given to the mounted units.
9. Officers must be close to their men.

The Officer will proceed to locate headquarters, guard-room, hospitals, gun and transport parks, and will fix an alarm post for the unit, taking care that the approach to the latter is one that will permit concentration without confusion. If he has time, he should prepare a plan of the area. He should ascertain which are the best lines of approach for the main body, and also which lines are most suitable when moving forward to the advance.

In selecting the actual buildings for the accommodation of the troops, there are certain rules which form an aid.

For every room occupied for one night only, allow—

1 man	per	yard	for	rooms	up	to	15	feet	width.		
2 men	15	feet	to	25	feet.
3 men	25	feet	and	over.	

For horses, the stalls should be counted, and when there are no stalls allow 5 feet of length per animal, and where buildings are over 24 feet wide allow for two rows of horses.

A space of 60 yards depth by 150 yards is required for each Cavalry, Mounted Infantry, or Infantry unit, as an alarm post.

In estimating the number of troops for a large area, the houses may be measured in accordance with this data, and

an average taken of the number of each class, the troops being distributed accordingly.

As soon as all arrangements have been made, the regimental billeting party will return to a rendezvous which should be in rear of the billeting area, far enough back to permit the troops moving forward, without halting, toward their area, and will guide their units direct to their billets, where each part of the units will proceed to occupy its quarters.

When troops are moving into the area, care must be taken to see that they move forward, and that there are no halts. Troops should not be allowed to return along the main route, but should be directed to go round.

On arrival at the billets, the Commanders of the units, or portions of units, will distribute the troops according to the arrangements made by the billeting party. Before dismissing the troops to quarters, they should inform them of the following matters:

1. The alarm post, and method of giving the alarm.
2. Action to be taken on the alarm being given.
3. Any local orders, *re* inhabitants, etc.
4. The bounds within which they are confined.
5. Position of Headquarters.
6. Detail of guards and duties.
7. Detail of sanitary or other fatigues.

Either before or immediately after the troops have gone to their quarters, the fatigue parties should be paraded under an N.C.O., and latrines dug, if required, kitchens built, etc., or such other duties as the circumstances may demand.

Before proceeding to their own quarters, Officers should see that the men are comfortably quartered, and that hot

meals are in preparation, an Officer being detailed to see that they are served properly when ready.

As soon as the quarters are occupied, the routine duties as defined for camps will be appointed and will mount. These will be discussed later.

When billets are requisitioned it must be understood that the comfort of the residents must be considered, and their own private quarters left undisturbed. The provision of shelter is all that is required by law, and any other facilities, outside of the use of cooking utensils, can only be demanded on repayment by the Officer or man concerned. The use of fuel cannot be demanded unless it is shared by the inhabitant.

As soon as troops are ordered to occupy any particular area, the advance-party allotted should be sufficient to enable the Staff Officer in charge to take the following precautions:

Sentries should be placed over all houses which are reported as containing patients suffering from infectious or contagious diseases.

All roads should be picqueted in the direction of the enemy, to avoid the transmission of information.

Search should be made for carrier pigeons, telephone lines, wireless apparatus, etc., leading in the direction of the enemy, and any found should be taken charge of by the advanced troops.

It may be necessary in hostile country to take several hostages for the good behaviour of the inhabitants. Notice should be posted by the Civil Authorities warning the inhabitants of the penalties for offences against our arms.

All places selling liquors should be placed under military control.

Orders regarding the use of lights, fires, etc., must be

issued. It may also be necessary to establish picquets for this purpose.

All ranks must be warned against conversing on military matters, or against leaving documents which could convey information around.

Sentries must be posted over all magazines, etc., and every house occupied by troops should be left in charge of a soldier, to insure the safety of arms, accoutrements, etc.

The administrative duties in regard to billets are generally described in our later discussion of all camps, since they are applicable to all forms of encampments.

When troops are leaving billets, the greatest care must be taken to see that they are left in a sanitary condition.

The particular points that require attention are the following:

Billets must be searched by a Company Orderly Officer, to see that no arms or accoutrements are left behind.

The equipment of the men should be examined before they leave the vicinity of the billets.

All papers and other documents should be burned and the ashes scattered before leaving.

All latrines, kitchens, etc., should be dismantled and filled in before leaving.

In making arrangements for the evacuation of billeting areas, the Staff will see that the orders as to approaches to starting-points are so distributed that units move forward to their own starting-points without crossing the line of advance of other units. Graphics are used to illustrate possible points of contact.

Units should form up on their own parade-grounds facing in the direction of their line of advance, and when moved should be carefully regulated so that they do not arrive at the point before the hour assigned for them; nor should they be late, since that will be even worse, owing to the fact that

every unit marching in rear of them will likewise be held up, thus delaying the whole column.

Sufficient warning of the hour of march should have been issued to insure the men getting a hot meal before starting, and arrangements for filling water-bottles, and issue of haversack rations should be made in plenty of time to allow all ranks to be ready to resume the march at the appointed time.

When troops are to occupy bivouacs, an advance-party will be moved forward with the protective troops, and as soon as the tactical situation will permit, they will move out to the destination and select the camping-ground, which would be previously selected by the map. The advance-party will consist of an Officer of the " Q " branch of the Staff, some Mounted Police, an Engineer and Medical Officer.

In selecting a site for a camp, the ground should be dry, and on gentle slopes which facilitate drainage. Steep slopes are to be avoided. Large woods with undergrowth, low meadows, the bottom of valleys, and newly turned soil, are usually damp. The site of an old camp should be avoided, since the ground is invariably polluted. A good water-supply is essential, and good roads for the use of transport should offer facilities for administration.

In estimating the capacity of water available, the following formula is used. The rough average of a stream can be gauged by the following method:

Select some 12 or 15 yards of the stream where the channel is fairly uniform and there are no eddies. Take the breadth and average depth in feet in three or four places. Drop in a chip of wood and find the time it takes to travel an even distance, say 30 feet. This will give you the surface velocity in feet per second. Four-fifths of this will give the mean velocity, and this multiplied by the sectional area will give the yield per second in cubic feet.

One cubic foot of water represents roughly 6 gallons.

On active service allow 1 gallon per man *per diem*, and 5 gallons per horse *per diem*. In standing camps the figures are 5 and 10 gallons respectively. This does not allow for washing purposes.

As soon as the water-supply is found satisfactory, the quality should be tested by the Medical Officer, who should make an inspection of the vicinity to locate possible contamination.

Upon the water-supply being found satisfactory, protection must be provided to prevent pollution. For this purpose flags are used, as follows: White, for drinking-water, which should be the farthest *up-stream*; blue, watering-places for animals, which must be above washing-places; red, for washing-places, below all other positions.

Protection must be provided for the banks, to prevent them being broken down or the water polluted by animals when watering.

It may be necessary to construct watering-places near the bank for animals, the water being raised by means of the pumps carried with the Field Engineers.

Where running water is not available, troughs may have to be constructed, the pumps of the Engineers being utilized. In this case the different watering-places will have to be fenced or otherwise protected.

The pumps carried by the Field Engineers are capable of supplying 600 gallons per hour, with a combined lift and force of 60 feet, with four men at work; but twice that amount where the lift is small, as on the steep banks of a stream, with two or three men at work. Apparatus for tapping water mains is carried with Field Engineers.

If receptacles are used for the water-supply, care must be taken that they are clean, and if necessary chemical treatment should be given.

In allotting bivouacs for troops, the divisional Staff will make the distribution by brigades as a rule. It will rarely be possible to bivouac the troops on one piece of ground, and in making the selections of the sites the Staff Officer will be guided by the same tactical principles as govern the distribution in billets.

The Staff Officers of brigades, accompanied by their unit representatives, will join the divisional Staff Officer when the main body arrives within two or three miles of the camp, and receive their areas from him.

They then proceed to distribute their commands in accordance with the topography of the ground. Certain rules must be observed when doing so.

Sufficient space will be allotted to the unit according to the accompanying table, and an addition made for the alarm posts of Cavalry, Mounted Infantry, and Infantry units, of 60 yards in the immediate front of their bivouacs. Transport units assemble on their bivouacs in case of alarm.

The position of the latrines should be fixed to the leeward of all water-supply and kitchens, at a distance of not less than 100 yards. Care must be taken that the soakage from the latrines does not percolate through the soil to the water-supply.

Streets should be left between units, and main streets through the centre of the camp.

The units should lay in camp in battle formation, the Infantry being in advance, transport units behind, and protected by the forward troops. Horse lines should be at least 50 yards from other troops, except in the case of their riders or drivers, who should be quartered with their animals.

The space required by the different units is as follows:

<i>Unit.</i>	<i>Bivouac Space (in yards).</i>		
Army Headquarters	100 × 150.
Divisional Headquarters	50 × 100.
Brigade Headquarters	30 × 50.
Cavalry Regiment	160 × 150.
Cavalry Squadron	50 × 150.
Artillery Battery, R.H. or R.F.A.	75 × 150.
Artillery Battery, Heavy	60 × 150.
Cavalry Brigade Ammunition Column	100 × 100.
Divisional Ammunition Column	600 × 100.
Engineer, Field Squadron	70 × 150.
Engineer, Field Troop	50 × 50.
Engineer, Field Company	35 × 150.
Signal Squadron	75 × 175.
Signal Troop	50 × 60.
Divisional Signal Company	75 × 150.
Do., H.Q. and No. 1 Section	50 × 100.
Do., Nos. 2, 3, and 4 Sections, each	10 × 100.
Infantry Battalion	75 × 150.
Cavalry Field Ambulance	80 × 180.
Field Ambulance	120 × 200.

Additional units may be found in the Field Service Pocket-Book.

Allowance must be made for the following space in front of guns or vehicles:

Heavy gun, 16 yards.	|	Six-horse gun or vehicle, 12 yards.
Four-horse vehicle, 8 yards.		One or two horse vehicles, 5 yards.

One yard should be allowed between each vehicle.

A horse requires about 5 feet frontage, with a distance of 4 yards between picquet-line and heel-peg. A gangway of 5 yards should be maintained between horse lines or between buildings or tents and horse lines.

As soon as the main body arrives, the men are led direct to the area they are to occupy, in the case of dismounted troops being formed up in battalion or company order, when they remove their packs, pile arms, etc. The Cavalry and

mounted units are halted in lines, the men dismount, picquet ropes are stretched and horses tethered, either in troops in line or, if ground is suitable, by squadrons, the gangways for the bivouacs of men being interspersed between the horse lines. Transport units will be parked in the most suitable formation. In all cases the parts of units will be held together. Officers will bivouac at the head of the lines of their command, the position of all officers being uniform throughout the lines, to facilitate their location in case of need.

As soon as the troops remove their equipment, latrines must be dug. They should be sufficient to accommodate about 5 per cent. of the men.

Incinerators should be constructed by the pioneers, and the greatest care as to sanitation must be observed.

Sentries must be posted over arms, and also over horse lines.

Similar directions to those described for billeting should be given to the troops as far as they are applicable. If troops are confined within the camp area, sentries may have to be posted at all camp outlets.

Special orders as to grazing areas, watering-places and times, may have to be issued.

On departure, the camp grounds must be carefully cleaned up, and all latrines marked with the letter "L," formed with stones, etc.

When troops are to occupy encampments, the necessary parties for pitching tents will be detailed.

Tents are not normally carried on campaigns; when they are provided, extra transport must be added to carry them. The English pattern tent is intended to shelter sixteen soldiers.

In marking out tent areas, allowance must be made for 10 yards between the outer tent-pegs between units, and

from 1 to 3 yards between the integral parts of a unit. One yard should be allowed between all lines of tents, $7\frac{1}{2}$ yards from centre to centre.

The perimeter of a camp is illustrated in the Field Service Pocket-Book. Tent doors should face away from the prevailing winds, and in mounted corps away from the horse lines.

For marking out an individual tent, a hole should be dug in the centre, about 6 inches deep, into which the pole can be slipped if heavy rain is encountered, to prevent the guy-lines from breaking. From the position of the centre pole, four paces should be allowed as the outer radius of the tent. For the position of the door, one pace should be allowed, and a peg driven at each point, three paces from the centre pole. The other pegs are five paces from these, around the radius of the 4-yard circle, each peg being five paces apart from its neighbour. This will give the four main guy-ropes. The pole is placed in centre of tent cover laid on ground, and the tent raised, the pole being placed at centre peg, and perfectly straight. The remainder of the pegs may then be driven in, one pace apart, and in line with the seam of the tent.

Drains should be dug around the tent, the earth being heaped on the inside of the coarse canvas flap.

Where hutments are used, the troops will be told off in accordance with the accommodation. Usually the huts are built in series to conform to the strength of the units occupying them.

RULES APPLICABLE TO ALL CAMPS, BIVOUACS, AND BILLETS.

As soon as the troops are allotted to an area, a district or brigade Commander should be appointed to take command of such area.

He will usually be one of the formation Commanders, and with his Staff he will prepare orders for the government of the camp and any civilians in the vicinity.

As a rule his first duty will be to see that no information is transmitted by the inhabitants, and he must take all precautions to prevent this being done. In this regard he will follow up the preliminary arrangements of the Staff Officer of the advance-party. Attention must be paid to stopping all communication by mechanical means, and the posting of sentries over all outlets.

He will direct the appointment of an inlying picquet, and any duties which he desires to be carried out by them. Guards will be posted over all magazines, stores, etc., and all defensive measures taken.

He may order the troops to be held in a state of readiness, in which case the troops will remain accoutred and sleep beside their arms. The rifles of the Artillery should be taken into their quarters or bivouac by the men and not left on the gun-carriages. Guards and inlying picquets will always be in a state of readiness.

The method of giving the alarm and action to be taken will next be decided, unless fixed by Standing Orders. Usually this is the case, and an Officer is ordered to report to the next senior Headquarters from each unit, or part of unit, as soon as the troops are standing to. At all times there must be a Staff Officer at Headquarters to receive and issue orders.

Immediate steps must be taken to mark all Headquarters, telephone or telegraph stations, and notice-boards prepared directing the troops to various important points such as depots, main communications, Headquarters, etc., where time permits. These may be utilized periodically, and are carried on the transport.

The different branches of the Staff will immediately

prepare orders regarding the different subjects with which they are concerned. These will include the following:

General Staff Branch.—Security, patrols, attitude towards inhabitants, intelligence work, as regards obtaining any information from inhabitants. Control of defences and construction of such field protection as is necessary. Control of the local telegraph and telephone systems, and operation by military operators.

Adjutant-General Branch.—Military law in regard to the inhabitants, covering use of lights, fires, control of traffic, issue of passes, collection of arms; appointment of military tribunal to deal with cases of violation of laws, military orders regarding movement of troops around area, provost duties, detail of guards, picquets, etc.; establishment of market for sale of approved articles and fixing tariff, control of liquor, etc.; sanitation and protection of water-supply, including preparation of time-table for watering and grazing, and provision of guards for same; removal of dead animals or their destruction, etc.

Quartermaster-General Branch.—Arrange for establishment of supply depots, movement of transport, issue of water by water-carts where necessary, and orders *re* the care of animals, etc. Slaughtering places and bakeries, if established, will be located as directed. The supervision of all permanent camps and instructions as to occupation.

Apart from the regular Staff, there will be detailed a Field Officer of the Day, Medical Officer and Quartermaster for the camp, and an Officer of the Day for each regimental unit. These Officers form a chain of responsibility to assist in carrying out the orders of the Commandant. The Camp Orderly Officers are responsible for the whole area, and supervise the issue of supplies, sanitation, etc. The Field Officer of the Day inspects all camp duties when mounting,

and visits them during their tour of duty. In case of alarm he takes charge of the inlying picquet. The Regimental Officer performs similar duties in the name of his own Commander.

The amount of improvement that can be made in the camp area will depend upon the length of time the troops are to occupy it, but every effort must be made to make the conditions as comfortable as possible for the men.

The employment of men whilst in camp depends upon the service they have had recently. On active service rest days should be employed in the repair of clothing, and rest for the men and animals. Men should be discouraged from wandering around, and orders may be necessary in that regard. Much can be done by the Officers in promoting suitable occupations for the men. Sports should be encouraged, as they tend to keep the men fit, whilst improving their moral and physical condition. Games are preferable to individual exhibitions, since they embrace a wider field. Concerts may be arranged for the evenings, the informal concert being more popular than the stage-arranged affair. The men, as a rule, know well the best singers, and things go with much greater zest. Occasionally a lecture on matters of general interest may be introduced, as they all tend to keep the soldier interested and cheerful.

If the camp is of several days' duration, training should be continued, to offset the ill effects which invariably follow from the slackness which usually follows continued marching. The drill should be strict, but in short bursts. The standard should be set for quality of work rather than quantity. Variations in the training may be profitably employed, but under no circumstances should the elementary training be passed over, unless the standard is exceedingly high. The fighting spirit should be promoted by sharp bayonet work, stories of prowess on the part of the unit and

affiliated units, and by keen competition in sports, for which purpose competitions with other units and formations are to be recommended.

The care of the soldier requires supervision in other respects, as the facilities on service are often very meagre. Inspections of bare arms, chests, and feet and legs, enable the Officer to see that the men are clean, both as regards person and clothing, and help to protect the clean soldier from the careless one.

In mounted and transport units extra attention should be given to the repair of harness and equipment and to grooming the animals. In camps and bivouacs, during cold weather, the animals should be wiped and rubbed rather than groomed. The removal of mud from the horse's legs and quarters, shoeing, etc., should be specially watched. Nosebags should be scrubbed and repaired.

When troops are continually marching, the strain on all ranks is particularly heavy, and upon the Officer falls the task of relieving the monotony by his leadership; and where he does not exhibit interest in the men and animals, there will be bound to be slackness and loss of *moral*. The spirit of sacrifice which the men have so frequently shown in the interest of the Officers is sown in the camp and bivouac by the small attentions which the zealous Officer shows in safeguarding the welfare of those under him, and it behoves us to remember that this is so, and to display the greatest energy in looking after those whom it is our proud privilege to command. This is the keynote to success for the Officer.

CHAPTER XII

UTILIZING THE RESOURCES OF A COUNTRY

Peace Preparations—Strategic and Tactical Advantages—Obtaining Resources — Requisitions, Method of making — Contributions—Confiscation—Purchases.

IN order to give the greatest freedom of movement to the forces in the field, it is necessary that the army shall always be assured of sufficient supplies to meet all its requirements. As we have previously seen, certain machinery is provided to keep up the chain of supply between the Home bases and the field forces. There will frequently be occasions, however, when the forces will move at such a pace as to make the extension of the lines of communication too lengthy a process to meet the particular requirements of the moment, when the Commander will be forced to abandon his project or find other sources of supply. During the period of strategical concentration the rapid movement of his troops is of most urgent importance, being a time when the freedom of the troops plays a greater part in the campaign than at any other, unless it be in the pursuit of enemy forces. During such times as these the use of local supplies may materially help in bridging the difference of time between the initial movement and the extension of the lines of communication. The extent to which the country may be compelled to maintain the armies will be dependent upon its reserves of supplies or man power upon which we can draw.

In time of peace the operations of Secret Service Agents

are directed towards the preparation of statistics upon which plans are prepared for future emergencies. All nations take these steps, and they cannot be looked upon as hostile acts. It is a question of policy which is much discussed in our own Governments as to how far we should go in making preparations for war in time of peace, but no sane person can deny that the nation that is ready to protect her interests and can throw her whole weight into the fray from the commencement of hostilities is much less likely to be attacked than one which has neglected to study possibilities and prepare herself accordingly. In any case, the nation that knows what she has to contend with in the event of attack is better placed than the one which aims to get information at a period when the gates of her opponent are closed to her. Whilst the acts of the individual agent are rarely heard of, and, when they are discovered, little sympathy is accorded them, even by their own people, they have a rôle no less dangerous or less worthy than that played by the most valiant soldier in the firing-line at a later date. The Power that discovers the foreign agent gives little more than a just trial for him, and frequently he pays the supreme penalty for an act of sacrifice. It is unfortunate that the part played by the Secret Service Agents must be shrouded in darkness, as many stories of bravery might be written under other circumstances than those which govern this branch of military and naval work.

The Intelligence Department at the War Office receives the report of the agents, and after applying the information to its proper sphere in the discussion of plans, both offensive and defensive, it is filed away for future reference. From time to time the information is revised, and the necessary changes made in the plans previously prepared. In the event of war being declared, the whole becomes available for the use of our armies.

The scope of the information that may have a military value is not readily appreciated by the lay mind. The study of the armies and navies of other powers, their equipment, strength, and reserves, is but a small part of the work. Study of the country is necessary, the construction of railways, their plants, total tonnage of rolling stock, capacity of engines, sidings, freight and passenger accommodation, all matters of importance, are noted. The construction of roads affect military dispositions. In regard to the trade of a country, the extent to which she is self-sustaining, the amount of her exports and imports, the areas of production, industrial plants, distribution of labour, etc., are matters which very closely affect the strategic plans of the invader. Usually the railways radiate towards these areas, and both population and wealth are discovered there. Agricultural districts are valuable, since they provide levers whereby the effect of military pressure can be applied, since they are essential to the welfare of the population as a whole. The location of the national storehouses is therefore a matter which largely affects the plans of the army that seeks to impose its will upon the nation, either in protection of its own interests or those of others who depend upon them. It has never been a part of the British policy to wage war upon the civil population as a means to victory, and we are rightly proud of the fact. Frequently our policy has seemed disastrous and has roused the ire of our own people, and the amusement of other nations; but we have a recent striking illustration of the far-seeing policy which turned a former enemy into a solid support, willing to offer its best in the interests of her who was an enemy but a short time ago. What, then, is the object of amassing information of this kind? We shall see later that it is to deny the enemy forces the use of certain essential facilities and support, and to enable us to turn them to our own advantage,

although by our British system it is only in a spirit of fair trade.

Certain factors play a prominent part in the plans of the Commander-in-Chief. Strategic lines of advance usually mean a railway concentration at those points, because they are the natural roads through the boundaries of a country, or because they lead to the heart of its wealth and industry; and when once the latter are paralyzed, the Power must surrender. These strategic lines of advance must be rushed promptly or the enemy has the advantage of their use and occupation. To do this, our forces must move with distinct aims, and so we try to rush our mobile forces forward to secure and hold them, meanwhile mobilizing our strength to support them. Important railway centres will therefore be seized, and concentrations of rolling stock rushed to our own bases and utilized. In discussing the use of railways, we saw the different methods by which the railways would be operated. In regard to essential food supplies, clothing, minerals, etc., they are equally important, and areas of production of these articles are invaluable if held securely. Industrial concerns are probable manufactories for the output of munitions for ourselves, and draw our forces towards them for this reason. In order to appreciate their value, information is gained in time of peace, and our advanced troops given definite objectives. The enemy will realize the importance of these assets, and will endeavour to prevent us from getting them. The study of the people themselves, their habits, their political feelings, national spirit, and any dissensions which exist amongst them, religious differences, etc., are influences which may or may not assist the Commander inasmuch as the strength of opposition may be affected by them, and his policy towards them will be governed according to the extent to which their goodwill may be cultivated.

It has always been the British policy to sow a feeling of trust amongst those whom she has been compelled to subjugate by force of arms, promoting this feeling by conducting all operations with justice and regard to the civil population and their interests. To further this, our troops are strictly controlled. The civil population is protected by the discipline which governs the troops. Any act against the inhabitants is promptly punished, and even when they are actively engaged against us, they are given fair treatment. Similarly in regard to trade, the troops are encouraged to purchase, but forbidden to loot. The requirements of the army are met by local resources, but prompt payment is made. It is only when some deliberate act demands that adequate punishment be given that we resort to force to meet our demands.

The policy adopted towards the people is directed by the Commander-in-Chief, and is governed by the information which he has received regarding their dependence. This policy is communicated to all members of the forces, and strictly enforced.

If we take advantage of local resources, therefore, for the maintenance of our troops, it is a matter of definite policy, and the instructions of the Commander-in-Chief will outline the manner in which the resources shall be taken.

The resources may consist of transport, labour, supplies, stores, animals, or money, and when taken they are strictly regulated to the needs of the force as a whole.

The different methods by which they may be utilized are as follows:

1. Requisition.
2. Billeting.
3. Contribution of money.
4. Purchase by contract.
5. Purchases in the open market.
6. Confiscation.

In applying either of these methods, the Civil Administration is employed as far as possible. To this end any demand is addressed to the senior civil official in the locality, and he is instructed to meet them by a certain time, under pain of punishment for non-compliance.

The Commander-in-Chief will delegate powers to his subordinates in regard to the exercise of either one of these methods. Usually the power will be conferred only on Commanders of armies and detached forces. Power to requisition and billet may be given to lower Commanders, but Nos. 3 and 5, which are inflicted as punishments, are usually confined to Commanders of armies, and only then when the army is acting independently. As long as the Commander-in-Chief is in touch, he will retain these powers to himself.

When we are operating in a friendly country, these matters are regulated by agreement with the friendly Power, the contents of the agreement being made known to those concerned.

Requisitions may be made of supplies, transport, stores, animals, and labour, the latter being only used for the administration work of the army, or for construction other than field fortifications, the use of the civil population for active operations against the enemy being forbidden by the Hague and Geneva Conventions.

Power to requisition may be granted to any responsible Officer by any authorized person. Strict accounting must be made of all transactions, for which purpose a special form is used.

Requisition books are issued on Army Form F. 780. This form contains printed instructions to the person upon whom it is served to produce certain requirements at a given time and place, there to be handed over to the appointed Officer. The statement is recorded that payment will be made,

either on the spot or at a future time, for services or materials supplied, and the fact that any refusal on the part of the residents must be notified to the military officials by the civil authorities is also noted.

In making requisitions for labour, service, or materials, it is directed that the citizens must be made to feel that prompt payment will be made if the demands are met, and the proper authorities are instructed to see that this rule is carried out, upon compliance with the requisition.

Whatever service, or labour, or stores may be demanded, they are assembled under the direction of the civil authorities.

Upon arrival at the appointed place, a requisition receipt is given on the form contained in Army Book 361. This book is only issued to authorized persons. The book itself is numbered, and the form inside bears a voucher number. The form is made up into a set of three forms, two of which are copies, and which do not bear any printing, other than the number of the form. Upon the book being issued, a receipt is received from the Officer authorized to make requisitions, so that his signature is filed for future reference, and at the same time the number of the book and vouchers contained in it is recorded against his name. This affords a second means of identification.

As each inhabitant produces his quota of the demand made upon the civil officials, he is given a receipt on this form.

The receipt is made out in triplicate, the stub being filled in on the book.

The original note (*i.e.*, the printed form) is given either to the civil authority or to the person delivering the goods.

The duplicate copy is sent to the central or branch requisition Office by the Commander of the force or by the Administrative Service obtaining the requirements.

The triplicate copy is delivered to the person from whom

supplies are next drawn, when they have been consumed or used, as is the case with a detached force living on the country, or to the person to whom the supplies are delivered by the person commanding the requisition party.

In making out the form, carbon paper is used to make the copies.

The name of the person from whom supplies were received is printed in *block letters*, and the address likewise, the inhabitant being shown the name and address to make sure that it is correct.

The articles requisitioned must be fully described, and the quantity must be shown by weight or otherwise; vague descriptions, such as a number of bags or boxes, must not be used.

If the goods are taken for protection, the fact must be noted.

Money values will not be quoted, as they are fixed by superior authority, according to prevailing prices, but the quality will be shown as being good, average, or indifferent.

The Rank, Unit, or Force, must not be mentioned on the original form. The number and signature are sufficient identification as to authority, owing to the method of issuing the book which has been described.

Where payment is made on the spot, no requisition form of receipt will be given, but a receipt will be obtained in triplicate.

The form bears printed instructions to the holder to send the original note to the Officer Commanding the nearest British garrison, not later than one month from the date of receipt, when he will receive a receipt for it (Army Form F. 781). Should he receive no payment within one month, he is instructed to apply to the Commander of the nearest British garrison again, and apply for an inquiry to be made.

As has been stated, the principle of prompt payment is

followed, and the requisition bureaus are instructed to endeavour to get accounts paid as quickly as possible.

Where any requisition is not filled, decisive steps must be taken to enforce fulfilment. Leniency must not be allowed to be construed to mean weakness.

Only the needs of the army may be met by requisition, and when food supplies are demanded, three days' supply must be left in each household.

The use of the power of requisition must be strictly controlled, and for this reason books of requisition notes should only be issued on an authority given to the requisition bureau.

Under no circumstances should powers to requisition be given to any other than commissioned Officers.

Authority to requisition may be given to a party of troops who are detached, as in the case of Cavalry protective troops, but they must account for all supplies, etc., obtained.

Services and material required to augment the supply or service at depots will usually be requisitioned by specially appointed Officers of the Administrative Services concerned.

Wherever supplies or stores are requisitioned, the transport for their delivery should be obtained from civil sources if possible; separate notes will be given, however, for transport required to bring them in.

The prices are fixed according to a tariff prepared by the Q.M.G.'s branch, which will be considered in relation to the prevailing prices, no increase being allowed as a result of the existence of military operations. These prices will be published for the information of all concerned.

In the event of articles of exceptional value being requisitioned, as in the case of pedigree cattle or horses, the fact that they were of extra value should be recorded on the back of the form, but the actual prices to be paid will be fixed by the requisition bureau.

In regard to the use of buildings, no rent is chargeable during the war, nor can any claim for compensation be considered. After the war is over, a sum of money is usually set aside for the repair of damage to private property; and in order that the money may be spent in repairing legitimate damage or destruction by the troops, claims for damages should be recorded, and the Officer in charge of the area in which the claim originated should make a note to guide the Officers charged with this duty when adjusting claims at a later date.

By the provision of the Hague Convention, "All means employed on land, at sea, or in the air, for sending messages, for the carriage of persons or things, apart from cases covered by maritime law, depots of arms, and, generally, all kinds of war material, may be taken possession of, even though belonging to private persons; but they must be restored, and the compensation to be paid for them shall be arranged for on the conclusion of peace."

As a rule the transport, supplies, stores, etc., which are applied to military uses are paid for at the time of delivery or soon after, by exercising the right to requisition. By this means the civil population do not suffer as a result of delay in payment.

Should goods be taken at any time without making the usual requisition, for any emergent reason, a note stating the quantity of the goods, their ordinary commercial value, the use to which they were applied, and the body of troops for whom they were taken, should be forwarded to the nearest requisition bureau.

The positions of the various requisition bureaus will be published in Routine Orders from time to time.

As soon as the troops are landed in a foreign country, a Central Requisition Bureau is established on the lines of communication, and branch bureaus at suitable points in

advance of them. The latter are responsible to the Central Bureau for proper performance of their duties.

Officers empowered to requisition will be given definite instructions as to the following matters:

1. The resources of the neighbourhood in which the duties are to be carried out, and the attitude of the inhabitants.
2. The direction taken by other requisitioning parties, and the area allotted to them for obtaining supplies.
3. The description and quality of the articles or services to be collected.
4. The transport, if any, to be taken.
5. The strength of the escort and the Officer commanding.
6. Where supplies are to be delivered to on return.

As far as conditions will allow, the senior responsible civil authority should be dealt with, and all requisition notes should be given to him, leaving the adjustment in his hands. Occasionally it will be necessary, however, to deal direct with the producer.

The Officer in charge of the escort is in tactical charge of the whole convoy, and his directions for the safety of the force must be observed; but in issuing his orders he will be guided by the requirements of the requisitioning Officer as to the districts to be covered, etc. It must be remembered that owing to the mass of slow-moving transport which will be included in the convoy it will be difficult to protect if attacked, and consequently it will be very necessary to have a strong reconnoitring screen thrown out, to prevent the enemy getting into actual contact with the column.

The Central Requisition Bureau is responsible for the following duties:

Registration.—(a) The registration and record of requisition receipt books issued to all troops in the field.

(b) The recording of all details in connection with claims sent in for settlement.

(c) The recording of requisition receipt notes notified as having been issued.

Investigation, which should establish the genuineness of the claim.

Assessment—*i.e.*, fixing the prices for the goods in accordance with the tariff in operation, allowing a fair and reasonable price for goods or services.

Payment.—After investigation and assessment by them—payment may be made either—

(a) Direct to claimant by the Central Requisition Bureau, or by an Officer specially authorized by the Officer in charge of the Chief Requisition Bureau; but all payments must be notified to the Headquarters of the Chief Paymaster; or

(b) Through a pay office.

Branch requisition offices must submit all claims to the Central Bureau, and no payment may be made by them without the authority of that office. The registration, investigation, and assessment of the requisition may be made by the branch, but the payment will usually be made by the Central Bureau.

The Chief Paymaster will make all payments through the Command Paymaster. Before authorizing payment, the Paymaster will demand full particulars as to the authority for the debt to be contracted, and proper certificates as to the accuracy of the account. The Store Account to which the goods are to be charged will be shown.

Billeting is one of the most convenient methods of employing the resources of a country. We have already discussed the way in which billeting is carried out in a previous

lecture, but here we shall discuss its value to an army in the field.

Billeting may be carried out in three ways:

- i. Billets with full subsistence.
- ii. Billets with partial subsistence.
- iii. Billets without subsistence.

Billets with subsistence give the soldier shelter, food, and fuel, without making use of the administrative chain of the army. It thus provides a period during which the horses and transport personnel can rest, and also gives an opportunity for the lines of communication authorities to mass supplies for future use, or to bridge a gap in the chain of supply. This method can only be employed for a limited period, it being estimated that in rich agricultural districts the inhabitants can maintain ten men per inhabitant for a period of one week, the proportion being reduced to five or six men per inhabitant for the same period in industrial areas and towns.

The subsistence that can be demanded by a force is the ordinary fare of the inhabitant, except where there is reason to believe that food is being withheld, in which case a special scale may be employed. The use of billets includes fuel, although this cannot be demanded unless the inhabitant is sharing the fuel—*i.e.*, orders to light fires cannot be presented and enforced. Cooking utensils may be provided, however.

Where billets are supplied without subsistence, no payment is made during the war, although a sum may be set aside for payment after the war. For this reason record of the accommodation provided should be made.

Billeting with partial subsistence may be necessary where the inhabitants are only able to supply part of the required food. This may occur in a district where there is a supply of farinaceous foods, but a shortage of fresh meat, or *vice*

versa. Under these circumstances it will be necessary to utilize our own transport and supply for the balance of the rations.

As a rule, requisition notes will be used for billeting with full subsistence; but if payment is made, no requisition note will be given. The rates of payment are fixed on the tariff governing requisitions.

Contributions of Money can only be demanded to meet the requirements of the army, or for the costs of administering an occupied territory. When a demand for money is made, the civil authorities are served with notice as to the amount, and they become responsible for its provision. The collection is usually made through the taxes of the people, the assessment rolls of the area fixing the individual amount payable by each inhabitant. As in the case of taxes paid in time of peace, a receipt is given to the payee, and a general receipt for the sum as a whole is given to the civil official making the payment. The payments must be made in specie.

Authority to demand contributions of money can only be exercised by the Commander-in-Chief and, subject to his directions, by the Commander of an army or an independent force of a lesser size.

In all cases contributions of money are payable to the Crown, and may not be converted to the use of any individual, except under the regulations governing all expenditures made in the army. The money is paid into, and administered through, the office of the Paymaster, who is responsible for keeping all accounts in regard to same. He will show the total amount received and expended, giving authority for payments and obtaining receipts for same.

Purchase by Contract.—The use of this system demands the necessary time, and consequently cannot be adopted during the preliminary days of the war. As a rule, it will

only be applied on the lines of communication through the proper authorities.

When entering into contracts for the purchase of any goods or stores required by the army, a standard of quality will be established as far as available supplies will permit, and all articles delivered must be inspected by a proper authority before acceptance. The quantity purchased will be closely checked, and all articles will be entered on the charge of the Administrative Service making the purchase.

A regular form of contract will be used in which the terms of purchase, quality of goods, nature of articles, directions as to delivery, etc., will be included. In addition, a clause must be inserted stating that the contractor may not make requisitions, this power being confined to the military authorities. Care must be exhibited that advantage of military contracts is not taken by the contractor to use force on the inhabitants to carry out the terms of the contract, since hostile feeling may make it difficult for him to fulfil the conditions.

The closest observation is necessary to prevent abuse of contracts by persons bearing silent opposition to our cause, and any article offering opportunity to cause injury or sickness should be closely scrutinized before acceptance and issue.

Purchases in the Open Market.—This system is not to be recommended, owing to the natural tendency of tradesmen to increase prices when the demand is great. The system is expensive, and has the disadvantage that the quality of the goods is not always up to military standard.

It may occasionally be necessary to authorize small parties of troops to make purchases, for which purpose money may be issued, on proper authority, by the Paymaster.

Whenever this system is adopted, the purchaser should obtain a receipt in triplicate, and should append a certificate

stating the quality of the goods, and whether they were fit for military service.

Sometimes purchases are made in the open market, in order to obtain goods denied through any other system, or when local conditions make it a matter of policy to circulate cash through the market; but to be of value in either case the expenditure would have to be on a large scale, and will usually be discontinued as soon as the confidence of the people has been gained, and they are likely to meet our requirements by other means.

Confiscation is restricted to public property, and can only be applied with the consent of the Commander-in-Chief, or those to whom he has given his authority. Persons subject to military law caught seizing property without due authority should be charged with an offence under the Army Act, for which they will be punished after trial. Private property is inviolate, and cannot be taken.

The restrictions as to confiscation are rigidly laid down in the Hague Convention of 1907 as follows:

“ 1. Real property of a military character belonging to the State, such as forts, arsenals, dockyards, magazines, barracks, railways, canals, bridges, piers, and wharves, may in the interest of the military operations be damaged or destroyed, or may be seized and retained until the end of the war.

“ 2. Real property belonging to the State which is essentially of a civil and non-military character, such as public buildings and offices, lands, forests, parks, farms, and mines, may not be damaged unless this is imperatively demanded by the exigencies of the war. Such property may not be confiscated, but may be made use of until the conclusion of the war.

“ 3. All State property directly susceptible of military use, such as means of transport, appliances for the com-

munication of news, depots of arms, stores, and supplies, may be confiscated, as may also movable property belonging to the State, such as cash, specie, funds, and realizable securities which are strictly State property.

“ 4. Movable property belonging to the State which is not directly susceptible of military use, such as Crown jewels, pictures, collections of works, art, and archives, cannot be confiscated, although papers in connection with the war can be seized even if forming part of the archives.”

Whenever property is confiscated, an inventory should be made, and a report of the articles forwarded to General Headquarters as soon as possible, and another to the Central Requisition Bureau, and such property will be handed over to the representative of the Administrative Services concerned, who will make a report as to the receipt and disposition. Where the articles are utilized for our own forces, they must be accounted for, and all issues, etc., will be recorded in the usual manner by the service concerned.

Animals which are seized will be examined by the Veterinary Officer present in order to see that they are immune from any infectious disease, before being converted to use.

Articles for the use of the troops should similarly be examined to see that they are harmless.

Whilst general confiscation is prohibited to any soldier, except by the order of a competent authority, this does not prevent troops from seizing any article of offence, whether in actual use or not, but same must be turned over to proper authorities. In the normal precautions which the advance of our troops renders necessary, arms may be seized, even though they are private property, and telegraphs, railway stock, cattle, etc., must be taken charge of in order that they may not be converted to the use of the enemy. The circumstances under which they are found must decide the

action to be taken, but lawful captures made in the normal military operations will be regarded as outside the law of confiscation as far as the troops are concerned, but they must be handed over to the proper persons at the first opportunity. Under no circumstances can they be appropriated for the use of the individual.

CHAPTER XIII

FEEDING AN ARMY IN THE FIELD

Food Supplies—Scale of Rations—How obtained—Forage—Preparations—Subsistence during Sea-Voyage—Subsistence during the Strategic Advance—Concentration of Supplies—Distribution and Issue—Scale of Equivalents—Indents—Captured Supplies.

THE term "supplies" as applied in the military sense is intended to cover the following articles: food, forage, fuel, light, disinfectant, petrol, and lubricants for vehicles. These articles are supplied through the Army Service Corps, which is responsible for the transport and supply services.

The Director of Supplies is responsible to the Commander-in-Chief for the proper administration of his department, and will usually be attached to the Staff of the I.G.C., through whom he receives all instructions, and under whom he operates his system. The personnel engaged in the supply services is under his control. As is the case in all Administrative Services, he has representatives with all formations and at all depots, who look after the interests of the service in their particular area. The "Q" branch of the Staff is responsible for issuing all orders in regard to the operation of the supply services, other than technical matters and the routine duties, which are managed by the representatives of the service.

The operations of the field armies are limited by their powers of subsistence when on the move, and consequently every move will have to be considered in relation to the

ability of the supply service to meet its requirements. The provision of food and forage being more or less routine, the requirements being foreseen, the operation of the service can be arranged systematically, and, provided sufficient notice of the intentions of a Commander is given to the supply representative, there is usually little adjustment required to bring the necessary supplies within reach of the forces.

The system of supply must be elastic to enable it to accommodate itself to the movements of the field forces, and every effort must be made to utilize local resources to strengthen the available supply. Mobile troops must carry a reserve of supplies with them, and must be assured of sufficient additional supplies being within reach for replenishing their reserves. These may be obtained locally, or may have to be brought up over the lines of communication. In the event of it being necessary to push a force forward in any circumstance, provision must be made to obtain supplies by increasing the amount carried, or by making use of local supplies. The fundamental principle is to be remembered, that the army must be assured of its future requirements before it is moved, and all plans must be prepared with due consideration of this material point.

The Director of Supplies will receive instructions through the I.G.C. as to the situation of all depots and the quantity of supplies which he is to carry on hand, and will be advised as to the general distribution of same. He will then issue his orders to his subordinates in the various areas, who will be responsible for the maintenance of their proportion of the bulk total.

Strict economy must be observed in the use of supplies, and all issues must be supported by an authority.

Supplies will be obtained in the Home areas by the Director of Supplies at the War Office, in accordance with instructions obtained from the Q.M.G. They will be concentrated

under his direction, and will be shipped overseas according to instructions received through the I.G.C.

Within the theatre of operations, the supplies may be obtained locally, to enhance the reserve held in hand, and also from the Home Base of Supply. As a rule, the local resources will be utilized during the preliminary concentration, and will be issued to the troops for immediate consumption. Later local supplies will be gathered in and brought to the various depots, where they will be issued to the troops for consumption, through the usual chain of supply. Occasionally detached forces may have to live upon the country.

During mobilization the troops are fed under peace conditions, and when mobilized they are issued with their supplies, as laid down in War Establishments and described later, which they carry overseas with them. During the period of mobilization, the Q.M.G. will issue instructions as to the quantity to be obtained as a reserve, stating the quantity in a fixed number of days' rations. These supplies are immediately obtained and concentrated to form the first reserve to be forwarded overseas. These supplies will be exclusive of any supplies which may be obtained locally. The number of days to be maintained may be modified later by the Commander-in-Chief.

In obtaining supplies at the Home bases, contracts are usually made for immediate and future requirements. The terms of the contract include delivery at defined ports of embarkation.

The ration allowed for the soldier and animal is based on the amount of sustenance necessary to preserve physical condition of man and animal under active service conditions, with due regard to weight and capacity of the transport.

By scientific research, the field ration which is in use in our army is arrived at. It is estimated that this ration

gives the required amount of flesh-forming substance and heat-giving food to maintain the strength of the soldier. In the same way the forage ration allowed for each animal is based upon the necessary grain to give him nourishment, and a proportionate amount of bulky food to preserve his digestive system. The various articles of food that form the soldier's food ration and the forage ration of the animal have been carefully defined as being the best articles whereby the necessary force is given with the minimum amount of bulk weight.

In order to protect the soldier against inferior quality, with consequent loss of food value, each article is carefully defined as to its quality and, where applicable, its method of preparation, so that the greatest amount of nutriment is obtained. Thus, the biscuit which forms an important part of the ration must be made from a certain standard quality of flour and baked at a certain temperature, whilst its size and weight must be uniform. Every article of food has similarly been studied and standardized, whilst the various articles have been combined to produce the required food value.

The scale of rations may vary in different climates, but the normal field ration is as follows: For each soldier—

1½ pounds of fresh or frozen meat, or 1 pound (nominal) of preserved meat, or 1 pound of salted meat.

1½ pounds bread, or 1 pound biscuit, or 1 pound flour.

¼ pound bacon.

3 ounces cheese.

$\frac{5}{8}$ ounce tea.

¼ pound jam.

3 ounces sugar.

½ ounce salt.

$\frac{1}{30}$ ounce pepper.

$\frac{1}{10}$ ounce mustard.

½ pound fresh vegetables, or 2 ounces dried vegetables.

At the discretion of the General Officer Commanding in Chief, on the recommendation of the Senior Medical Officer, the following additions may be made:

$\frac{1}{10}$ gill lime-juice, when vegetables are not available.

$\frac{1}{2}$ gill rum.

Tobacco, not exceeding 2 ounces.

For each animal forage ration is authorized:

Horses over 15 hands $\frac{1}{2}$ inch	12 pounds oats, 12 pounds hay.
Heavy draught horses ..	15 " " 16 " "
Other horses ..	10 " " 12 " "
Mules, 15 hands ..	12 " " 12 " "
Small mules ..	6 " " 12 " "

The amounts for both men and animals may be varied by the Commander-in-Chief on competent advice, according to the peculiar requirements of any particular area of operations.

These rations are supplied in certain standard forms of packing to facilitate handling and issue. The form is standardized both as to construction and as to weight, and consequently every package containing a certain class of goods has exactly the same weight as any other of the same class.

In a previous lecture we discussed War Establishments, and it was then pointed out that the number of men and animals for every unit and for every formation was definitely fixed by the Establishment, and in a lecture on Equipment we mentioned that the total weight of every article that had to be carried in the field was carefully fixed, and the transport allotted to a unit was based on the weight and bulk to be carried. Now, in regard to supply, the number of men in a unit or formation being known, and the number of units or formations to be supplied in a larger formation being definitely stated, it becomes a matter of easy calculation (tables are issued for the purpose) to esti-

mate what the total weight of supplies for any formation is, and to apportion transport for its delivery in the supply units. This is actually done, and the various depots concerned with supply need only to know the number of formations in advance of any railhead to refer to their ready reckoners to estimate the quantity of each article to be shipped each twenty-four hours to that railhead. It is a simple matter of multiplication wherein your sum is as follows:

Multiply the weight of each article in a ration by the number of men and animals, and you have the total weight. Divide this by the weight in each package, and you have the number of packages.

To ascertain the transport necessary, divide the number of cases by the quantity that can be carried in any type of vehicle, all of which have been previously tabulated, and you get the number of vehicles necessary. Using weight, the same method can be adopted.

This illustration is quoted to make plain the amount of care that has been given to anticipating field requirements, and the importance of not allowing variations to creep into your establishments, since the effects are more far-reaching than appears on the surface.

In making dispositions, the Supply Department deals with the number of rations rather than the weight of individual articles.

Having explained how rations are fixed, and how they have been arrived at, we may now return to the method by which they are procured in the Home countries.

Contracts for overseas supplies are usually made by the War Office. They are made in writing, in which the specifications of the article are clearly defined; the wages to be paid and the terms and orders as to delivery are included, the deliveries being made periodically either to a depot or, in war, to suitable ports.

Foreign supplies may be shipped direct to overseas ports.

Payment is made monthly, and contracts may be terminated by the War Office at one month's notice. Guarantees are required from the contractor. Goods are inspected and passed by Government inspectors before being accepted.

Direct purchases are made from brokers, manufacturers, and producers. They are usually applied to forage from abroad, or small quantities of special articles at home. The prices paid will be fixed by expert valuers, basing them upon the current prices.

Where goods are condemned by Government inspectors, the articles must be replaced by the contractor; and if he fails to make good, the necessary articles may be purchased by the Government and charged to him.

When goods are shipped overseas, they are carried by either supply ships, chartered for the conveyance of supplies and nothing else, or by transports, which carry troops as well as supplies, or small quantities may be shipped by private freight-vessels. The system of supplying sea transport was fully explained in our lecture on that subject.

Shipping notes are made out in duplicate for each consignment, one copy being retained by the ship and the other being returned to the Officer in charge of the transport making the delivery to the ship, after same has been discharged into the vessel and a receipt given.

Carrier's notes are made out for the consignment and given to the transport carrying it, whether by road or rail.

Bills of lading are made out in triplicate, one being sent to destination of supplies, one retained by the service shipping same, and the third given to the master of the vessel. When supplies are unloaded from the vessel, a receipt is endorsed on the copy held by the master, any deficiencies being noted thereon.

Subsistence during the Sea-Voyage of Troops is provided on the vessel, and where the voyage is a long one, the provisions are provided in accordance with the Naval Transport Regulations. For short voyages the rations and forage are carried by the troops themselves, or are issued from military stores on board the ship.

Each unit carries with it a certain mobile reserve of rations, and this amount will be provided and carried for every soldier and animal. The quantity fixed must be maintained, and will be replenished as it is consumed.

Ships carrying troops will usually carry an extra reserve of fifteen days' supplies over and above the quantity required for the period of the journey.

During a voyage the troops may be employed to assist the ship's cooks in the baking of bread, etc., for which extra pay is granted. The issue of all rations will be supervised by the military officials, whether supplied by the Naval Department or not.

When troops are ordered to embark before dinner, or to disembark before that meal, they will be issued with rations for the current day. If orders are cancelled regarding the time of the movement, the earliest possible notice should be given to the ship officials, in order that a hot meal may be provided.

Subsistence during the Strategical Advance and Concentration, or during Periods of Halt.—During the early stages of the strategical concentration, the supply system being in process of establishment, it will be necessary for the troops to live upon the country. This may be accomplished by one of the methods which we discussed in our previous lecture—namely, requisition, billeting, or by purchase. Where the troops are spread over a wide area in small numbers the power to requisition may be distributed amongst responsible Officers with the different forces, the rations obtained

being strictly accounted for, in accordance with the instructions laid down in our lecture on the subject.

If the troops are concentrated in a small area, it will be necessary to organize convoys to secure the supplies and bring them in to the depots which would be established by the Supply Service. In this the use of local transport and labour will be necessary, since the available troops at that period may be limited in number. The information gained in time of peace materially assists in making the necessary arrangements before the strategic concentration commences. If labour and transport are scarce, it may be necessary to add sufficient administrative personnel and transport to secure the supplies for the use of the troops. In these cases the power to requisition will remain in the control of the Supply Service.

It may be necessary to arrange to seize all available supplies and to make issues for the civil population as well as the troops, in order to conserve the quantity available. This will be specially the case in towns and cities which are dependent upon the railway for their supplies, and the railway has been taken over for military purposes.

Where the tactical situation makes it possible, billeting will be adopted, since the supply of food for the forces is then thrown on the Civil Administration entirely. Again we can refer to our previous lectures on the subject of Billeting.

The amount of information which has been gained in regard to the food-supply of a district will govern the preliminary arrangements, and will decide the representation of the Supply Service which is necessary to maintain the force. The position in which they will move will likewise be indicated, and it may be necessary to push them forward before the columns of the strategic advanced force, under adequate protection, in order to concentrate the supplies

in the required areas. This course is dangerous from the tactical point of view, but will frequently be necessary. The extent to which they will penetrate the country should not bring them in advance of the farthest line of advance of the strategic troops, as they may thereby denude a district which will be required to support the larger forces when the main body is assembled. The Commander-in-Chief will issue his instructions as to the limits inside which they may make their demands. Strict economy must be observed in demanding stores, and they should only draw from the immediate vicinity of their operations.

The area in which the main body is being concentrated should be left untouched, and in order to maintain the strategic advance, extra rations above those authorized under War Establishments should be issued to the troops prior to the advance commencing. These rations will be carried as directed, and extra transport may be required.

When halts for any period take place, advantage should be taken of the time allowed to concentrate supplies for the use of the troops. The methods by which this is done have already been described, but we shall refer to them again with particular regard to the use of food supplies in a later part of the lecture.

It must be remembered that when a body of troops are quartered upon any section of the country, there is a double draught of supplies, since the population must be maintained as well as the troops, and consequently it will be necessary to allow a period of time to elapse in order that they may recover their losses. Subsequent bodies of troops, therefore, will probably require to be provided for from the lines of communication when passing through the same area. In this respect agricultural districts will be considered with due regard to the time of year, condition of the crops, and time in which they will be available. In Western Europe

it is calculated that the ordinary agricultural district can support a force twice the population for a period of one week, provided the district has not been previously traversed by troops, whilst the wine-growing or industrial districts can only provide for a considerably less number.

It has been estimated that an army of five or six divisions can be maintained without dangerous tactical distribution, for a period of one day, in most of the European districts of average population and fertility.

Concentration of Supplies in the Theatre of Operations.—As soon as the strategical force has advanced sufficiently far into the country to protect the bases which we propose to use, the administrative officials landed will establish the Base Supply Depot, or depots, for the reception of the supplies which will be shipped from the Home lands. We have already discussed the procedure adopted in this regard in the lecture on Strategic Concentration, and we have discussed the arrangements for the transport of supplies overseas. We now arrive at the point where the steamer has arrived at the Overseas base. The M.L.O. will make arrangements through the Base Commandant for the reception of the supplies. The O.C. Base Supply Depot will be notified of the time and dock at which the vessel will be berthed. As soon as she arrives, the necessary labour and transport will be sent to the dock, and will receive the supplies from the vessel, loading them into the transport, and will then take them upon the strength of the depot stores. As the goods are unloaded they are examined to ascertain whether they are in good condition, deficiencies being noted and damage reported, the particulars being entered on the way-bill of the master of the ship. The quantity of stores to be held at the base will be decided by the I.G.C., who is advised in that regard by the Commander-in-Chief. The number will be fixed in "rations," not more

than thirty days, nor less than five, for each man and animal on the field and lines of communication strength being allowed. The limitations are made to prevent wastage from depreciation in quality, and possible shortage from carrying too small a reserve, respectively.

When the base is being built up, the quantity received will be limited, and usually there will be but a small reserve over the actual quantity required to meet the daily demand; but the more the advanced troops are able to live upon the country, the greater will be the reserve which it is possible to hold for future requirements. During the early stages civil labour and transport will be used to provide the necessary carriage. From the base the supplies will be shipped direct to the advanced troops, until the distance they have been able to advance allows the establishment of further depots nearer the firing-line. In our lecture on the Lines of Communication we discussed the various points and their location. At the Advanced bases supply depots will be established as soon as they are considered safe, when these Advanced bases will be used to meet the daily requirements of the forces, their issues being made up by supplies from the Base Supply Depot. When they are first established, the same system of building up is followed as in the case of the Base Depot. Extra quantities are shipped forward from Base Depot each day, the reserve being held back for future use.

The distances to which these Advanced bases are pushed forward is entirely a matter of tactical security, but they should be as far forward as is consistent with safety. They may under certain circumstances be situated at the actual railhead, dependent upon the distance which that position is from the firing-line and the possibility of the enemy breaking through.

As the army advances, it may become necessary to advance

the forward depots even farther, in which case those previously formed may become an additional link in the chain of supply, depending upon the total distance to be covered.

At each advanced supply depot, the personnel and transport is allotted by detailing a certain number of companies of supply and transport, each having a fixed establishment. This labour and transport is utilized to bring supplies from the railway to the depots and *vice versa*.

In the case of the use of railways, the procedure given in our previous lecture on Railway Transport is followed. A fixed allotment of railway tonnage is made for each depot, in order that the forwarding of daily requirements may be made routine. As far as this allotment is concerned, the R.T.O. at the station makes all arrangements for the required siding accommodation through the Administrative Commandant of the Base. The Supply Service issues orders as to the supply of the necessary labour and transport, and at the appointed time has the loading and unloading parties there to receive or despatch the goods. Way-bills showing the contents of each truck are prepared and handed to the R.T.O., who wires their contents on to destination, so that the next station that has to deal with them will be prepared for their reception. As soon as a consignment is despatched from any base, the contents are struck off the strength of the base and transferred as a charge against the forward base, which takes the goods upon its strength. The advanced depots issue the daily requirements of the troops in advance, and the base depots will supply the deficiency created, up to the limitation made by the I.G.C., and communicated through the Director of Supplies. One base depot may supply several advanced depots according to their situation, and occasionally it will be found better to assemble certain articles at one base and others at another. In this case the different articles are despatched each day to

the different bases, being combined into rations at the advanced depots, where they are shipped to the troops by standard-type pack trains. We shall discuss these later.

In selecting the sites for depots, the proximity of the railway must be considered, since the operations of the supply services at the base consist of constant shipments. The site must be dry and of sufficient area to accommodate the large quantities that must be handled. Good roads are a necessity, and may have to be provided by construction of new roads. In addition there must be facilities for water and lighting, as the work will be carried on continuously. Shelters are necessary for certain articles, and must be provided.

When organizing a depot, the nature of the ground must govern the general distribution, but as far as circumstances will allow, the following matters will be arranged:

Field bakeries will be established to leeward, in accordance with the direction of the prevailing winds.

A laager will be constructed for the reception of slaughter cattle, which should be clear of the depot and well supplied with water.

Inflammable stores must be away from danger of sparks from engines, and far enough away not to endanger other stores.

Shelter must be provided for perishable goods.

Sheds for sorting supplies upon arrival are necessary.

Stacks of stores should have sufficient road spaces between to allow vehicles to draw up to the stacks, and to provide passing room for other vehicles.

Drainage must be constructed.

Ramps and platforms for loading must be constructed.

Signboards should be placed directing traffic to all points of importance, due consideration to the question of possible congestion being given.

The lay-out of the depot should be such as to facilitate the easy issue of supplies.

As supplies are received at a depot, they are checked as to quantity in bulk, and haphazard selections of packages are made to test the quantities in each by actual weight.

The quality is examined by an expert Officer when received. As each consignment is received, it is entered in the stock sheets of the depot, and issues are deducted in the same way. The Officer in charge is responsible that the oldest stores are issued first.

In accordance with the general directions of the Commander-in-Chief through the I.G.C., the Administrative Supply Officer at all bases is responsible for the collection of all supplies. For this purpose he may requisition supplies, labour, and transport, and in the absence of civil labour he may use the personnel under his command, assisted by such additional labour as he may be able to procure from the Lines of Communication Defence Forces, under an arrangement completed by the I.G.C. and the G.O.C. Defences. These supplies are assembled at the various bases, and are taken on charge and issued in the ordinary way. The method of procuring them has already been described in a previous lecture.

The supplies forwarded to railhead each day from the advanced depots are packed into trains carrying a standard quantity of rations and forage. The packing is arranged to facilitate unloading at railhead, where the various columns take over the supplies. The standard type pack train carries sufficient rations and forage for 20,000 men and 5,800 animals, or, roughly, sufficient for an Infantry division. A Railway Supply Detachment goes on the train to superintend the issue of rations, and to take charge of them during the journey.

On arrival at the railway regulating station, the trains

are marshalled until they are required at railhead. As soon as there is room for their reception, the train is sent to railhead, where the supplies are taken over by the road transport.

We must now diverge a little to consider the various columns and units which are responsible for the handling of supplies beyond railhead, returning later to complete our journey.

The distance between railhead and the troops will decide the number of echelons of transport to be provided. The methods of conveying goods by road were explained in the lecture on Transportation, but they must be considered in relation to each of the Administrative Services with which we shall deal. Where it is impossible for the columns to connect up with the field formations, and return to railhead in twenty-four hours, at the same time allowing time for the troops to rest, it will be necessary to insert the fourth echelon into the chain. This takes the form of reserve parks, which are provided in the proportion of one for each division in the field.

Working from rear to front, following the line of supply, these are as follows:

<i>Infantry Division.</i>	<i>Army and Corps Troops.</i>	<i>Cavalry and Mounted Troops.</i>
1. Reserve Park.	Reserve Park.	Reserve Park.
2. Supply Column.	Supply Column.	Supply Column.
3. Train.	Regimental Transport.	Regimental Transport.
4. Regimental Transport.		

It will be noticed that army, corps, and mounted troops have only three echelons; this will be explained later.

The reserve parks are placed under the command of the I.G.C. on the lines of communication, and are used as transport units until required to bridge the communications in advance of railhead. They may consist of mechanical,

but usually consist of horse transport. They carry a reserve supply of rations for one Infantry division and one-sixth of a Cavalry division and army troops. Two days' rations can be carried on the reserve parks.

The supply columns draw their supplies from the reserve park or from railhead direct, and carry them forward to the field formations. They may be either army, corps, or lines of communication units, according to the distance they operate from the troops.

The supply columns are allotted as follows:

Infantry Division.—One divisional supply column, consisting of two parts—namely, the transport and supply details. We are only considering the supply section here.

It has the following allotment of vehicles, apart from workshop personnel and relief vehicles. For postal service, two 30-cwt. lorries; for supplies, thirty 3-ton lorries; for hay and oats, fourteen 30-cwt. lorries; and four 3-ton lorries for Ordnance stores. Its total complement of supplies allows for 20,000 men and 5,800 horses.

Army Troops or Corps Supply Columns.—These units are formed from companies of the A.S.C., and carry one day's rations for their respective troops. The number of vehicles allotted to the Supply Service is as follows: For Corps troops, supplies, four 3-ton lorries; Ordnance stores, one 3-ton lorry; and for postal services, one 30-cwt. lorry. For Army troops, three 30-cwt. supply lorries, with spares, relief, workshops, etc.

Cavalry Supply Columns.—For a Cavalry division, Cavalry Divisional Supply Column has two M.T. companies, and is organized into Headquarters and two sections. Each has fifty-four supply lorries and one postal lorry, all being 30-cwt. type.

Cavalry Brigade Supply Column, for detached brigade, has a Headquarters and two sections. Each section has

thirteen 30-cwt. supply lorries and one 30-cwt. postal service lorry.

The supply columns form the connecting-link, which transfer their supplies to the divisional train in the case of Infantry, and the regimental transport in the case of army, corps, and mounted troops.

The divisional train that accompanies the Infantry division is organized into a Headquarters and four horse transport companies. The first company is the largest of the four, and carries the total needs of the whole of the troops of the division, with the exception of the three Infantry brigades, which are each supplied by one of the three remaining companies. The allotment of vehicles to the train, as provided by War Establishment, is as follows:

<i>For Unit.</i>		<i>Supply.</i>	<i>Baggage.</i>
Headquarters of Division	..	1 G.S. wagon.	2 G.S. wagons.
" Artillery	..	1 " "	1 " "
" Engineers	..	1 " "	1 limber "
3 Field Artillery Brigades	..	24 " "	18 G.S. "
1 Howitzer Artillery Brigade	..	8 " "	6 " "
Divisional Ammunition Column		5 " "	4 " "
1 Cavalry Squadron	..	2 " "	1 " "
1 Cyclist Company	..	1 " "	1 " "
3 Field Companies, R.E.	..	3 " "	—
1 Mobile Veterinary Section	..	1 " "	—
1 Pioneer Battalion	..	2 " "	4 " "
Signal Company	..	1 " "	—
3 Field Ambulances	..	3 " "	9 limber "

Total vehicles: for supply, 53; baggage, 47.

Supplies carried for about 6,000 men and 5,000 horses.

Nos. 2, 3, and 4 Companies, each.

Headquarters of an Infantry			
Brigade	..	2 G.S. wagons.	1 G.S. wagon.
4 Infantry Battalions	..	8 " "	16 " wagons.

Total vehicles: for supply, 10; baggage, 17.

Carries supplies for 4,200 men and 300 animals in each section.

The baggage section carries the blankets, kits, etc., of the units, and forms the second-line transport when detached from the train, and marching with its own unit.

The regimental transport consists of the field kitchens or supply wagons which are a part of the establishment of the unit.

It is necessary to have a thorough grasp of these different units to understand exactly how the supplies are distributed in the various columns, and since their movements are based upon the quantities they carry and the units they serve, it is advisable to get a practical knowledge of the composition, etc.

Having defined the different links in the chain of supply, we will return to railhead and consider how an Infantry division is supplied, when the slight variations which occur in the case of other troops may be summed up in a few words.

The trains having arrived at railhead under the charge of the Railway Supply Detachment, the supplies are handed over to the column or to a Railhead Supply Detachment. The vehicles of the supply columns or, where used, the parks, will be there as the train arrives, and will be labelled with a distinguishing mark to indicate the nature of the supplies which they are to load. Corresponding marks will be displayed on the trucks, so that each driver will know exactly to which truck to draw to receive his load. Each driver is given a slip upon which is defined the quantity of each article to be loaded. This slip is retained by each man in charge of a railway truck, so that the final issues may be checked after completion of the loading.

As soon as the supply columns are loaded, they move out to their rendezvous; as will be remembered, this is fixed by the "Q" branch of the Staff, and on arrival there the Senior Supply Officer of the divisional train will meet the supply

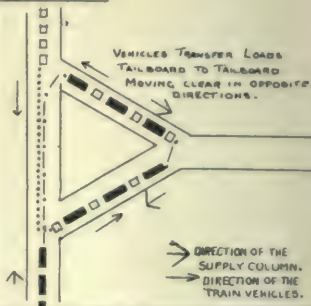
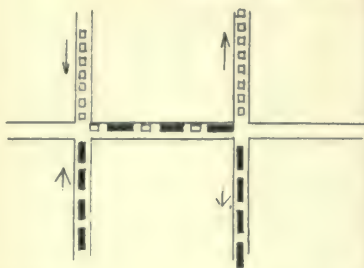
column and issue his instructions as to the route to refilling points. If the responsibility of the lines of communication has been fixed as ending at rendezvous, the escort, which has accompanied thus far, will halt and rest, whilst a new escort will be provided from the division, and will proceed with it to the refilling point. Frequently the refilling is done at the rendezvous. The divisional train is then reloaded from the supply column, the different companies being issued with their quota of the divisional supplies.

Refilling points must be carefully selected so that they do not impede the traffic on the main thoroughfares, and usually they are situated on a side street or in a market square. The supply columns enter from one direction, halt at intervals sufficient to allow the train vehicles to pull in tailboard to tailboard, and as the train vehicles come in from the opposite direction, they pull in behind the supply columns cars and obtain their load, passing out the opposite way to that in which they came. The supply column vehicles return to railhead or to the rendezvous of the park as soon as it has been emptied, and refill for the following day, when the journey is repeated.

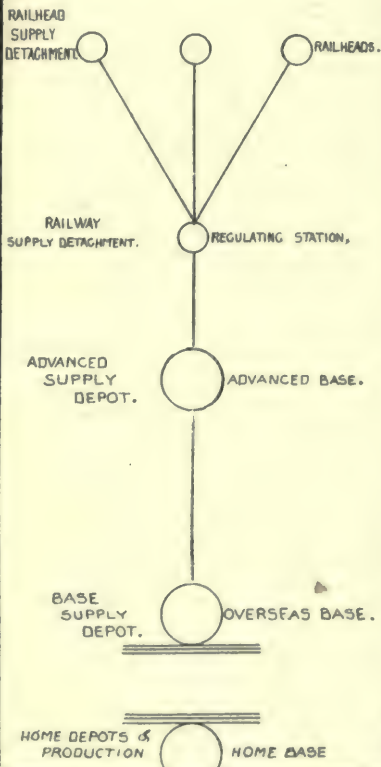
The position of rendezvous and refilling points varies with the circumstances under which they are created. If the troops are stationary, the rendezvous and refilling point will usually be at the same place, and will be close to the area occupied by the troops in order to relieve the strain on the horse transport. When troops are moving daily, the rendezvous may be at or in advance of the place where the troops were quartered on the previous evening. The troops will usually be on the march from the place, and the train will be left behind empty, having transferred its supplies to the regimental transport. The supply column will then come forward to the refilling point, transfer its supplies to the train, which resumes the march in rear of the column,

SUPPLY SYSTEMS.

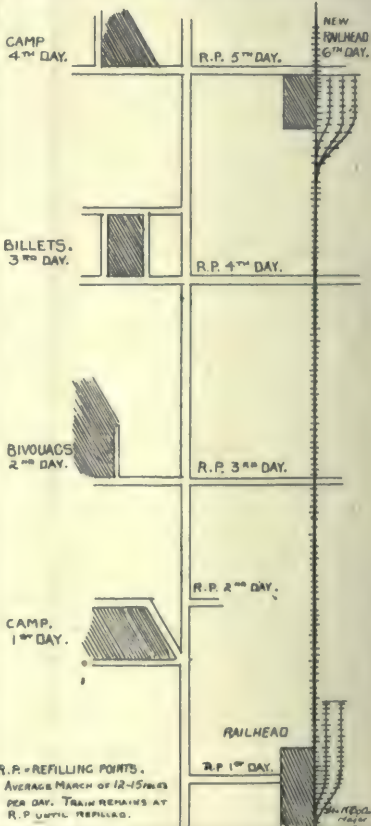
OPERATION OF REFILLING POINTS.



SUPPLY SYSTEM TO RAILHEAD.



SUPPLY SYSTEM TO MOVING FORCE.



overtaking the troops in time to issue their supplies to them the same evening. On the following day the system is repeated, the journey of the supply column lengthening out until the maximum distance has been reached or the rail extended.

In fixing the distance which must be traversed by the supply column, the principle followed is to reduce the length of the journey to be made by the horse transport. The mechanical transport can cover a distance of 45 miles each way per day, and the horse transport a distance of 16 miles, or 8 miles each way, so that a margin of 63 miles is allowed, usually sufficient to meet all requirements in a civilized country.

After the train has refilled, it follows the troops which it supplies and rejoins the column in the evening. The rations for the following day are then issued to the troops, again leaving the train empty until refilled by the column on the following morning.

In transferring the supplies to the regimental transport, the companies of the train are split up and move to the area occupied by the particular troops for whom they carry supplies. Thus the Headquarters Company will move to a central point in the area occupied by the divisional troops, usually behind that occupied by the Infantry at night, whilst the remaining three companies move into the areas occupied by their respective Infantry brigades. The Regimental Quartermaster attends there with his transport, and receives the supplies, which he carries back to his unit for issue.

The companies of the train may either deposit their stores at a prearranged spot, establishing a field depot, or they may issue direct from the transport. In either case the actual spot where supplies are to be moved is fixed by the Staff concerned—the "Q" branch in regard to divisional

troops and the Staff Captains of Infantry brigades for the Infantry. Notice of these points is sent to the Brigade Supply Officers—*i.e.*, the officers in charge of supply sections of the different train companies—and also to the different battalions in the brigade, so that all are warned as to time and place where supplies will be issued.

A Brigade Board consisting of the Field Officer of the Day, Field Quartermaster, and Field Medical Officer, assembles at issues of the rations and examines the quality before issue.

The rations are then taken by the Regimental Quartermaster to the Regimental Headquarters, where the Orderly Officer of the Day will be present to inspect them and see that they are properly divided by the Quartermaster. The Company Quartermaster-Sergeants then draw their supplies according to their strength, and carry them back, either by the orderly men or by the regimental wagons, to the companies, where the supplies are cooked as required and issued to the men. When the supplies are cooked they are again inspected by the Orderly Officer, who is also present when they are finally distributed to the men to see that they are properly cooked, divided, and finally distributed.

This completes the chain of supply from the base to the soldier.

In cooking the rations, the field kitchens are used by those units in possession of them, otherwise they are cooked by the use of field kitchens constructed in the field, "dixies" being used for cooking purposes. The dixies hold sufficient rations for eight men when vegetables are issued and fifteen without. Small dixies cook for five men with vegetables and eight without. The company system of cooking is to be recommended, since it insures economy in cooking, but frequently it is necessary to issue the dixies and allow the men to cook their rations by sections. The men use their

mess-tins to eat the food, with their table knives and forks carried in the holdall in the haversack.

Having considered the manner in which the soldier receives his ration, we may now turn our attention to the quantity carried in the field formations. The quantity varies according to the hour of the day.

Number of Days' Rations carried in the Field.

On the soldier:

Bread or biscuit, jam, cheese, salt, pepper,
and preserved meat

On field kitchen:

Fresh or salted meat, tea, sugar, bacon ..
Vegetable ration when available ..

1 day.

On divisional train

1 day.

Total 2 days.

Emergency Rations carried (consisting of 1 pound preserved meat, 12 ounces biscuit, $\frac{5}{8}$ ounce tea, 2 ounces sugar, $\frac{1}{2}$ ounce salt, 3 ounces cheese, 2 cubes (1 ounce) meat extract)—

On soldier

1 day.

In divisional train

1 day.

Total 2 days.

The emergency, or iron, rations should only be consumed on the order of an Officer commanding an army, or when the soldier has been cut off from his command for an extended period.

Variation in Supply at Certain Periods.—The soldier carries the current day's rations between his haversack and the regimental kitchens, and by evening will have consumed his ration. There will be that period when the man and regimental transport will have no ration, or when the day's ration carried in the divisional train has been transferred to the regimental transport, when only one day's ration will be available until the arrival of the supply column to replenish the train supply.

The situation at that time will then be as follows:

<i>First Situation.</i>	<i>Second Situation.</i>
On the soldier or regimental transport Nil.	Partly on soldier and partly on regimental transport .. 1 day.
In the train 1 day.	On train Nil.
Supply column, on way from railhead 1 day.	Supply column, on way from railhead 1 day.

The difference to be noted is this; the division is not ready to move at that period as far as its reserve of supplies is concerned.

Variation in Supply in the Case of Cavalry, Mounted, Army, and Corps Troops.—These units not being provided with trains, the supply columns move from railhead or from the park, as the case may be, right up to the area occupied by the troops, and issue direct to the regimental transport. The proceedings are exactly the same in all other respects, and all that it is necessary to learn in regard to the distribution is that one fact, to eliminate the train from the chain of supply.

The Headquarters of Cavalry A.S.C. attached to a Cavalry division is responsible for the supervision of issues and preparation of the indents for Cavalry formations. They will meet the columns at rendezvous, and direct them to refilling points which will be situated in brigade areas.

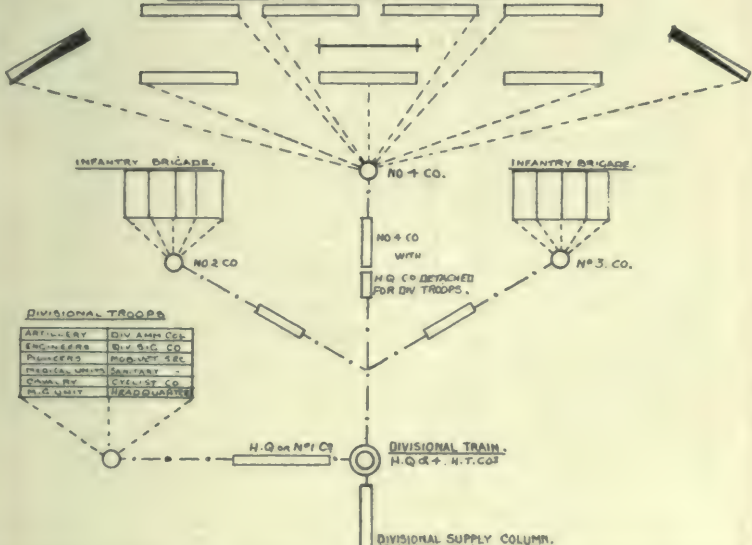
When Cavalry are directed to live upon the country, it is this Headquarters that will carry out the duty of procuring supplies and issuing them, availing themselves of the transport with the units for the purpose, unless special transport has been allotted.

Variations in Distribution within a Formation.—When a battle front has been developed, the massing of the troops into mixed brigades will naturally occur. The Artillery will be supporting their respective Infantry brigades, whilst the field ambulances and field companies of Engineers will be

DISTRIBUTION OF SUPPLIES.

INFANTRY DIVISION

(PROTECTIVE TROOPS) INFANTRY BRIGADE GROUP.



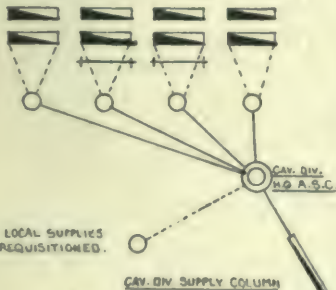
DIVISIONAL TROOPS

ARTILLERY	DIV AMM. CO.
ENGINEERS	DIV SIG. CO.
ENGINEERS	POSTAL SEC.
MEDICAL UNITS	SANITARY
CAM. BV.	CYCLIST CO.
H.Q. UNIT	HEADQUARTERS

DIVISIONAL TRAIN.
H.Q. CO + H.T. CO'S

DIVISIONAL SUPPLY COLUMN.

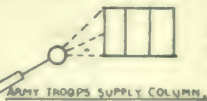
CAVALRY DIVISION.



CORPS TROOPS.



ARMY TROOPS.



RAILHEAD.

----- REGIMENTAL TRANSPORT

--- TRAIN

--- L.I.C. on CORPS.

○ RENDEZVOUS & REFILLING POINT

○ FIELD DEPOTS.

B. N. Collins
Major.



occupied with their respective groups. Under these circumstances it will lead to congestion of traffic in an area if the various transports of the units have to go back to refilling points for divisional troops which may be some distance in the rear. This is overcome by "attaching" these units to the Infantry brigades for rations, when the O.C. train will redistribute the necessary transport to the company affected, and send the supplies up to the more advanced depots. The provision of separate vehicles, as shown in the list of train vehicles, allows this to be done without seriously interfering with the operations of the train.

Variations in the Scale of Rations.—When local supplies are being utilized, there will usually be difficulty in obtaining the articles specified for the ration of the soldier or animal, and to facilitate the issue of the necessary food value a table of equivalents is adopted. By this table the supplies usually available can be applied to army needs.

Table of Ration and Forage Equivalents.

Oatmeal	..	..	..	4 ounces equal	4 ounces bread or biscuit.
Biscuit	..	..	..	1 pound	„ 1½ pounds bread.
Rice	..	..	..	4 ounces	„ 4 ounces bread or biscuit.
Chocolate	..	..	..	½ ounce	„ ½ ounce tea.
Preserved meat	..	..	..	1 pound	„ 1½ pounds fresh meat.
Porter	..	..	..	1 pint	„ 1 ration of spirits.
Dried fruit	..	..	..	4 ounces	„ 4 ounces jam.
Bacon	..	..	..	4 ounces	„ 4 ounces butter, lard, or margarine, or ½ gill of sweet oil.
Barley	..	..	..	1 pound	} All equal to each other.
Straw	..	..	..	2 pounds	
Bran	..	..	..	1½ pounds	
Malt	..	..	..	6 ounces	
Hay	..	..	..	1½ pounds	
Oats	..	..	..	1 pound	} equal 10 pounds oats, and 12 pounds hay.
Compressed forage	..	..	..	18 pounds	
Forage cake	..	..	..	20 pounds	„ 12 pounds oats, and 12 pounds hay.

These articles may be substituted for the regular rations where necessary, without depreciating the food value to the troops or animals.

It was stated previously that the supply columns may be either army, corps, or lines of communication troops. This depends upon the distance which they are required to cover. The only difference made in regard to their operations is this : if the columns are lines of communication units, they move under the direction of the I.G.C. as far as the limit of his jurisdiction, when they pass into the control of the field forces. If they form part of the army or corps troops, their movements are directed entirely by the field forces. In either case the " Q " branch of the Staff is responsible for notifying the I.G.C. of the position of the rendezvous to which the supplies are to be sent.

Method of demanding Supplies and Accounting for Same.—The I.G.C. will be responsible for forwarding sufficient supplies to the armies in the field, and will advise the supply services as to the movements of the various formations in order that they may adjust their transport accordingly. He will also notify them as to the point of contact—*i.e.*, the rendezvous. The transport always moves loaded to capacity, irrespective of the actual numbers which are in the units. That is to say, however many casualties the unit may suffer, the transport of the supply service will be filled. The surplus which is left in the hands of the train or supply column is checked and held as a reserve. Without due regard to the actual number of rations required, therefore, the supplies are pushed forward. The actual demands being made in front, we will deal with them in the reverse order—namely, from front to rear.

The regimental unit indents for its supplies of rations and forage on Army Book 55. This form shows the number of Officers and men on the strength, and number for whom

rations are to be drawn; it also shows the number of animals, classified according to their military status. A space at the bottom is provided for extra issues such as rum, tobacco, lime-juice, etc., when authorized. Petrol and lubricants required for mechanical transport are indented for in a space set apart for that purpose. A section of the form is provided wherein component parts of any ration may be enumerated. If the unit has a supply of any article on hand, therefore, the number of necessary issues to make the complete rations required may be stated in actual issues of each article in the ration. The indent is made out in duplicate, and upon issue being made, the Officer from the supply service will give a receipt showing actual issues made on the duplicate, and will obtain a receipt for same on the original.

The Brigade Supply Officer—*i.e.*, the Officer in charge of the supply section of the train—then prepares a statement of his own requirements on A.F. W.3316. On this form he records the several units to whom he has made issues, showing their issues in similar form to that mentioned above, except that the totals of the whole of the units are bulked at the bottom. On the back he fills in a similar certificate as to the quantities received and issued, and the balance he has in hand. By this form his requirements to complete the number of rations required can be ascertained.

The Senior Supply Officer of the division receives these reports from the four Brigade Supply Officers, and bulks the totals on A.F. W.3317, the only difference being that on this form he states the formations represented by his Brigade Supply Officers' reports, bulking the totals on his own form. This form is passed through the divisional supply column for railhead. Demands for the supplies needed from advanced depots are made on A.F. W.3326, and when issues are made receipts are obtained on A.F. W.3327, certificates

as to the balance held in hand being recorded on the reverse side.

The system of book-keeping on the lines of communication below railhead need not concern us; therefore we shall not waste time upon them, except to mention that every article issued and received must be accounted for, and careful checking is adopted to prevent loss.

Forage is issued in exactly the same way as the rations, and the same quantity is carried in the field as above—namely, two days.

The issue of “extras,” petrol, lubricants, etc., is checked in exactly the same manner, and the supplies are delivered by the same transport.

Field bakeries and butcheries are usually established at the advanced depots to provide fresh bread and meat respectively for the troops in advance.

A field bakery is capable of baking bread for 26,000 men in ten ovens for each of six sections. Each section can bake 4,320 rations of bread in $12\frac{1}{2}$ hours, or, where wagon steam-ovens are used, 5,400 rations in 12 hours. The bread is shipped to the front in sacks, the issues being made as in the case of other articles.

A field butchery is capable of killing and dressing meat for 22,500 men. It is organized into three butcher squads. The animals intended for slaughter must be kept without food for at least twelve hours before slaughter; consequently it will only be at fixed stations such as a depot, or during halts allowing sufficient time, that the butchers will be able to prepare meat for the troops. Fresh-meat rations are carried in the same way as all other food supplies.

Supplies captured from the Enemy.—When supplies are captured from the enemy, they are examined to ascertain that there is no danger from their use, and then are taken

into stock and issued in the ordinary way, A return of all supplies captured is made on A.F. W.3324.

Slaughter cattle captured from the enemy must be examined by a veterinary officer before being used.

Any officer who captures any food supplies, etc., is responsible that they are turned over to the representative of the supply service with the force at the earliest possible moment.

Destruction of Supplies to prevent Capture.—The destruction of supplies should only be undertaken when there is the gravest danger of them falling into the hands of the enemy, and may only be carried out then on the order of the superior authority available. In issuing the order for the destruction of any supplies, the Commander will generally consult with the senior representative of the supply department who is present.

Any supplies destroyed will be reported on A.F. W.3325.

CHAPTER XIV

ORDNANCE SERVICES IN WAR

Clothing and Equipment—Field, Scale of—Base Reserve—Replenishment—Distribution and Issue—Ordnance Workshops.

THE Ordnance Services are responsible for the supply of all stores needed by an army, with the exception of medical and veterinary stores. These include arms, ammunition, equipment, clothing and necessaries, technical vehicles and stores for the Artillery and Engineers, etc. They also receive all captured arms, ammunition, colours, trophies, and other stores.

The Ordnance Service is controlled by the Director of Ordnance Services, who is responsible to the I.G.C., and through him to the Commander-in-Chief, for the provision of these articles, and for the establishment of workshops on the lines of communication and mobile workshops in the field, for the repair of damaged material of all kinds, and for the administration of the personnel engaged in these services.

He has representatives at all bases and on all formations in the field, who adjust all Ordnance matters in the particular area to which they are attached.

The principles upon which the Ordnance Depots in the field are built up is similar to that of the Supply Services and will not need further description here. The base depots are established at the various bases, and are known as Base Ordnance Depot, Advanced Ordnance Depot, etc.

When troops are mobilized, they are issued with a complete

set of clothing and equipment before taking the field. Each soldier therefore takes the field fully clothed, armed, and accoutred, and the unit carries all equipment necessary for its operations in war. The Ordnance Depots are then responsible for the replenishment of consumable goods and replacement of damaged or lost equipment, the collection of such articles, their repair and return.

The equipment that is carried into the field by the soldier is classified as follows:

CLOTHING, which is divided under several headings:

Personal.—Ankle boots and shoes, caps, drawers, canvas suits, service dress suits, puttees, sashes, cardigan waist-coats, trousers, tunics, leather gloves, foreign service helmets, gauntlets, cotton drawers. On the decease of the soldier these articles are not reissued and are usually sold, the money being credited to the **account** of the soldier's next of kin.

Public.—Great-coats, full-dress head-dresses, knee-boots, leather breeches, jack spurs, leggings, waterproof capes, purses and belts for Highland regiments. These articles are returned to stores, and are reissued for use.

NECESSARIES.—Badges, blacking, laces, braces, brushes, button brushes, combs, forks, grease-tins, worsted gloves, holdalls, hose-tops, housewives, knives, razors, shirts, socks, sponges, spoons, spurs (swan neck), towels, vests. These articles are supplied to the soldier free on enlistment, and must afterwards be maintained at the expense of the soldier himself. On active service the articles may be renewed without charge, unless they have been lost through negligence.

SEA-KIT.—Clothes-bags.

These articles are issued to the soldier through his unit, and are referred to as the personal kit.

War outfit comprises the whole of the equipment issued to the unit to bring it up to War Establishment. Part of

this is reissued to the soldier, whilst the remainder is carried with the unit, either on the men or on the transport.

Clothing and necessaries and supplies, the latter alluding to the one day's rations referred to in our last lecture, are part of what is described as the "Personal Equipment."

"Personal Equipment" comprises the equipment (arms, ammunition, and accoutrements) which is issued to the soldier for his personal use, and which he would take with him when transferred or when proceeding overseas.

Regimental Equipment represents such arms, accoutrements, ammunition, etc., as are not personal equipment, and also the guns, vehicles, harness, saddlery, stationery, tools, cooking utensils, signal equipment, technical stores, and all other stores which are necessary to enable the unit to perform its duties in the field. These articles remain on charge as a part of the equipment of the unit, except medical and veterinary equipment, which are received from the respective services, and which are classified separately.

Ammunition is described as "Service Ammunition," which is carried on the soldier and used first, and "Regimental Reserve Ammunition," which is carried in the transport to refill the pouches of the soldier as required.

The quantity of material required for a unit on mobilization is defined in the "Mobilization Stores Tables" which are issued to the unit concurrently with the War Establishments.

The quantity defined in the table referred to is that upon which the transport of the unit has been based, and the tables are the authority for the unit to draw upon Ordnance for the amount.

In time of peace the necessary stores are assembled in Mobilization Stores and held there until required. Current issues are made from these stores from time to time, and

new articles are substituted in order to avoid loss from damage whilst storing.

The personal equipment of a Reservist is stored at the depot where he has to report on mobilization, being allotted in accordance with the measurements taken when the man is discharged to the Reserve, each set being given a number corresponding to the number borne on the man's mobilization card, referred to in a later lecture. The balance of the stores required for the unit are stored in the Regimental Mobilization Stores, ready for issue.

Any extra articles required to equip men who have not been allotted to a unit, or where a new unit is formed, are indented for from the Ordnance Services, and issued from the depot responsible for the supply of that mobilization centre.

Every soldier is issued with the following articles for field service, which are disposed of as follows: Carried by every dismounted soldier:

Clothing worn by the Soldier.

- | | |
|--|---------------------------|
| 1 pair ankle-boots. | 1 pair braces. |
| 1 cap. | 1 identity disc and cord. |
| 1 pair woollen drawers. | 1 paybook. |
| 1 Service jacket with badges. | 1 pair puttees. |
| 1 clasp knife with tin-opener and marline-spike. | 1 shirt. |
| 1 cardigan waistcoat, if required. | 1 pair socks. |
| | 1 pair trousers. |

Equipment and Accoutrements.

- | | |
|---|--------------------------------|
| 1 set of web equipment. | 1 water-bottle with carrier. |
| 1 rifle, oil-bottle, pull-through, and sling. | 1 bayonet and scabbard. |
| | 1 entrenching tool and handle. |

Articles carried in Pack.

- | | |
|---|-----------------------|
| 1 cap comforter. | 1 towel. |
| 1 holdall, containing laces, tooth-brush, razor, shaving-brush, comb. | 1 great-coat. |
| 1 pair socks. | 1 housewife. |
| | 1 mess-tin and cover. |
| | 1 piece of soap. |

Including the one day's ration carried in the haversack, and the water-bottle filled, this gives a total weight of about 61 pounds actually carried by the soldier. This also includes 150 rounds of S.A.A. There are variations in the kit of Highland regiments, pipers, drummers, armourers, pioneers, etc., and also in the case of certain N.C.O.'s who are armed with the revolver, but the general kit is not varied.

Carried by every mounted soldier:

Clothing worn by the Soldier.

1 pair ankle-boots.	shaving-brush, comb, knife, fork and spoon.
1 great-coat with badges, and cap comforter and pair of socks carried in pocket of coat.	1 pair braces.
2 identity discs with cord.	1 Service cap.
1 Service jacket with badges.	1 pair cotton drawers.
1 knife with lanyard, tin-opener, and marline-spike.	1 field-service dressing.
1 pair puttees.	1 paybook.
1 pair socks.	1 pair pantaloons.
1 cardigan jacket (carried in fold of great-coat if necessary).	1 flannel shirt.
1 haversack, with holdall containing toothbrush, razor, laces,	1 pair jack spurs.
	1 housewife complete.
	1 piece of soap.
	1 towel.

Arms, Accoutrements, and Equipment.

1 rifle with oil-bottle, pull-through, and sling, or	1 sword and scabbard.
1 bandolier.	1 lance bucket and revolver with pouches.
1 water-bottle and carrier.	1 haversack.
1 mess-tin and strap.	

Saddlery, Horse Furniture, and Stable Necessaries, carried on the Horse.

1 corn-bag.	2 horseshoes, 1 fore and 1 hind, in shoe-case.
1 nose-bag with 6 pounds of corn.	1 horse-brush.
1 picqueting peg.	1 suringle pad.
1 picqueting rope.	1 heel-rope.
Saddlery, with blanket, head-rope, and rifle or lance bucket set,	1 horse-rubber.

Including the rations for one day, water-bottle filled, and S.A.A., the total weight carried by the horse, exclusive of the weight of the man, is 101 pounds. Variation in this list exists in the case of Warrant Officers, N.C.O.'s, signallers, range-takers, etc.

In addition to the above, a kit-bag is left at the base, either in the Home country or overseas, according to the orders of the Commander-in-Chief, in which the following articles are kept. These articles are intended to be forwarded when required to the field forces by the O.C. the Spare Baggage Section.

Clothing.

1 pair ankle-boots.	|	1 pair cotton drawers.
1 Service jacket.	|	1 pair trousers.

Necessaries.

1 hair-brush.	|	1 flannel shirt.
1 pair worsted socks.	|	1 towel.

Dismounted men leave a pair of canvas shoes, and for Highland regiments an extra pair of hose-tops in addition.

In the event of operations taking place in tropical climates, khaki drill uniform is substituted for the Service uniform.

Transport drivers in Infantry units are issued with certain articles of the mounted men's clothing, and carry the horse furniture and necessaries on the transport.

For the further particulars as to the articles issued you must refer to the various equipment regulations.

It is impossible for us to consider the numerous articles that go to make up the war equipment of the unit, since they vary in every unit according to its organization and purposes, but they are defined in exactly the same manner, with the result that the total weight to be carried, transport necessary, etc., is carefully considered in time of peace, and arrangements made for issue in war.

The soldier, it will be seen, carries sufficient clothing and equipment to meet his immediate needs when proceeding overseas, so that time is allowed the Ordnance Services to build up their supply of these articles before they are likely to be required.

With regard to the technical equipment required for the operation of the various arms, the life—*i.e.*, the military period of service—of each article allows a margin in which the materials can be assembled.

In calculating the needs of the army overseas, it must be remembered that in the case of the Ordnance stores most of the articles will have to be brought overseas, since very little of the materials they handle can be procured in the theatre of operations. For this reason, the consumable stores, such as ammunition, explosives, etc., will be demanded from the commencement, and consequently preference is given to these articles when concentrating stores overseas.

The Q.M.G. through the Director of Ordnance in England will be responsible for meeting the demands of the overseas forces, and will take the necessary steps to procure same. In time of peace the reserves of stores carried is decided by the available funds, coupled with the policy which dictates the responsible people in this regard.

A reserve of ammunition, guns, and other munitions will be carried at the arsenals of the country, and these will be drawn on as the first supply; but the Home authorities will have to take steps to organize munition factories and to increase the production of existing factories as soon as war is declared. The stores so procured will be assembled at the bases in the Home country in exactly the same manner as has been described in the case of the supplies, except that usually preference will be given to shipment of certain classes of Ordnance stores, owing to the importance of their use in war.

The shipment of the stores overseas follows the same routine as in the case of supplies, except that the handling, labour, transport, etc., is supplied by the Ordnance Service instead of the Army Service Corps, unless same has been supplied by the latter unit on indent.

Upon the arrival of the goods overseas, they are received and unloaded under similar arrangements to those of the Supply Service, subject, of course, to the change of personnel and transport as regards the service affected.

The depots of the Ordnance Service are manned by Ordnance companies, which include mechanics capable of providing the necessary skilled labour to effect all repairs to the different articles handled by the service.

The location of Ordnance bases needs particular care, since the contents of the depots are of a highly combustible nature, and every precaution must be taken against fire. The depot will be handling serviceable and unserviceable goods, so that provision must be made for suitable buildings to keep the two classes separate, and workshops must be provided for the repair of articles. The materials handled will include heavy equipment, so that power will be required to handle them. For the same reason the depot must be close to the docks and to the railways.

Issues are made from the various depots along similar principles to those of supplies, with the exception of ammunition, to which we shall devote a separate lecture, since it intimately affects the fighting troops and has several features which require explanation.

Articles required to replace stores are indented for by the units, and issued from the advanced depots and shipped by rail to the railhead.

In order to facilitate the maintenance of sufficient stores in the field tables of possible requirements have been drawn up as a guide. They are based on the needs of various

formations, such as an Infantry or Cavalry division, brigades, etc., or, in the case of clothing and necessaries, upon the basis of 1,000 men of each class. To facilitate the issue of clothing, tables have been worked out showing the various proportions of each size required for the average body of troops, and shipments are made according to this table. In the same way all articles required by a unit are tabulated, and consumable stores are recorded with regard to the probable requirements, basing the tables on monthly demands.

As a result of this system of keeping definite lists of stores, the Commander of a depot may estimate his requirements, basing them on the number of troops in advance of his depot. The advanced depots issue the requirements of the troops, being replenished from the base depots. Railway accommodation is indented for in the same way as for supplies and all other materials, the same principle governing the allotment of daily tonnage for normal needs.

To facilitate issue, Ordnance stores which are issued in bulk quantities are made up in standard packages, each package having a fixed weight and quantity, and as a table has been prepared showing the quantity of various articles which can be carried on the ordinary Government vehicle, it is easy to fix the number required for transport purposes.

The following are a few of the more common articles and the number contained in a package:

Blankets	..	..	..	..	..	bales of	25.
Boots	..	..	..	..	..	cases ,,	45 pairs.
Great-coat	..	..	..	..	..	bales ,,	25.
Field dressings	..	..	..	..	..	cases ,,	500.
Helmets	..	..	..	..	..	,, ,,	20.
Kettles, camp	..	..	..	..	..	crates of	5.
Puttees	..	..	..	..	..	bales ,,	200 ,,
Service jackets	..	..	..	..	..	,, ,,	50.
Service trousers	..	..	..	..	..	,, ,,	50.
Shirts, flannel	..	..	..	..	..	,, ,,	100.
Socks	..	..	..	..	..	,, ,,	300 ,,
Towels	..	..	..	..	..	,, ,,	200 ,,

A General Service wagon can carry any of the following loads: 400 blankets, 300 felling axes, 600 hand axes, 190 picks, 780 billhooks, 200 camp kettles, 600 picqueting pegs, 240 large horse-rugs, 260 small horse-rugs, 640 G.S. shovels, 350 R.E. shovels, 28 circular tents, 1,800 picqueting ropes, 600 ground sheets in cases, or 900 loose ground sheets.

Ordnance stores are shipped to railhead, and when the stores are valuable they are accompanied by a convoy party. On arrival at railhead, the stores are loaded into the vehicles of the supply parks or columns. For this purpose each column or park has some vehicles attached for ordnance stores. The distribution is as follows:

Divisional Supply Column	..	..	..	4 lorries.
Corps Troops Supply Column	..	..	..	1 lorry.

This transport is utilized for all normal requirements, but where technical vehicles or bulky supplies are forwarded, the I.G.C. will provide the necessary transport, or will make arrangements for the necessary motive power to take same forward to the field forces. The movement of the transport coincides with the Supply Service, being directed in the same way. On arrival in the area occupied by the troops, the stores are turned over to the regimental transport or to the train, as the case may be. In the case of Cavalry formations, special transport is added to the Cavalry Supply Columns as required.

Since the normal stores required by each unit can be foreseen, with the exception of ammunition, which will be dealt with later, demands are usually made fortnightly, and arrangements are made to send up the requirements of the different units in rotation, thereby enabling the available transport to be used to the greatest advantage.

The representative of the Ordnance Services with a formation collects the indents of the units in a formation.

On the indents, which will be made on the ordinary indent form when available, but which may be made on any paper in the field, the O.C. unit will make a certificate to the fact that the goods are needed to replace articles lost or damaged from ordinary wear and tear, or when they are the result of negligence or deliberate damage he will state the soldier to whom the reissue is to be charged. When the necessary articles are shipped to the unit, a receipt must be forwarded on the packing note or way-bill, acknowledging the receipt of the goods.

Where any article is to be returned for repair, arrangements will be made by the field unit for the shipment back to the Ordnance Depot.

When articles are drawn direct from the Ordnance Depot by a unit, a receipt must be given by an Officer when the goods are arms or ammunition, or in case of a large consignment.

Surplus stores or captured articles are returned through the Ordnance representative with the force, who will give a receipt to the Officer making delivery. In the case of captured material, instructions as to its disposal are issued from time to time, but it will usually be returned to the Home country for disposal there.

The Ordnance Service is responsible for the inspection of all guns, technical vehicles, etc., required for the armies in the field, and also for the periodical inspection whilst actually with the field units. Inspectors will be delegated to this duty, and they will make their reports to the Officer in charge of the service within the field of operations.

Establishment and Operation of Workshops.—Workshops for the repair of ordnance material will be established at each depot. Articles sent there will be repaired and again returned to service. When an article is no longer serviceable it will be utilized for the repair of other articles as far

as is practicable, or will be disposed of in accordance with instructions issued by the Director of Ordnance Services. Usually such articles will be returned to England for disposal.

In advance of railhead there will be a certain number of mobile workshops. These are classified as Heavy or Light Mobile Ordnance Workshops, according to their equipment and establishment.

Anti-aircraft Gun Workshops are allotted to each three detachments of aircraft guns, and are equipped with two workshop lorries and the necessary store vehicles.

Ordnance Travelling Workshops have two workshop lorries, store vehicles, etc., the crew consisting of artificers capable of making light repairs to equipment.

Heavy Mobile Workshops have heavier equipment carried on four workshop trucks, drawn by steam tractors, and can do repairs to guns, etc., when of a minor nature.

With the different formations and units there is a proportion of Ordnance personnel and armourers, who are able to deal with repairs to rifles, machine guns, etc., and who are responsible for the condition of the weapons within their command. They should make periodical inspections to see that they are properly cared for.

Salvage companies have been created for the assembly of all damaged materials, and they collect all soiled clothing, etc., which is returned to Ordnance periodically, and utilized according to the nature of the article.

CHAPTER XV

AMMUNITION SUPPLY

System of Packing—Duties of Reserve Commanders—Capacity of Vehicles—Ammunition Parks—Ammunition Columns—Quantities carried with Field Units.

THE supply of ammunition in the field, as far as the concentration and distribution of the lines of communication are concerned, is under the control of the Ordnance Service. Beyond railhead the ammunition is carried forward by Ammunition Parks and Columns, which are specially allotted units formed by the Army Service Corps, who supply the transport and personnel and drivers, but having a few artillerymen attached for the handling of the projectiles. The artillery formations in the field direct the movements of the parks and columns in accordance with the demand.

The I.G.C. is responsible for the co-ordination of the Lines of Communication Parks, as far as making connection with the field units is concerned, and issues orders as to the movement of the columns within the area placed under his control. From that point forward the ammunition is taken up entirely in accordance with a chain of ammunition supply which we must study in detail.

Ammunition and explosives are commodities which are uncertain as to the quantity demanded and needed, and when demands are made they are of an urgent nature. Unlike food supplies, nothing can be obtained locally, and consequently the total needs of the army must be brought

over the lines of communication. Owing to the impossibility of gauging requirements beforehand, it is necessary that the system of supply shall be elastic and certain in its application. The importance of maintaining the supply cannot be exaggerated, since the success of the whole force depends on its supply of munitions.

Ammunition varies in type according to the weapon from which it is to be fired. It consists of gun, rifle, and pistol ammunition. The gun ammunition varies in type and weight, but may be classified under two headings—namely, the fixed shell, wherein the charge for propulsion, cap, and shell, form one piece, which only requires the addition of a fuze to make the round complete; and the separate type, which is forwarded in several pieces, consisting of the charge, projectile, fuze, and, in the heavier types, a friction tube and adapter.

The packing varies with the type, and affects the quantity carried by a transport, with the weight of the shell, charge, etc.

The projectiles fired by the 13, 15, and 18 pounder Q.F. guns are made in one piece, and are packed in boxes of four, whilst the 4.5-inch howitzer round is made up of several parts packed with two complete rounds in a box. The heavier guns have their rounds forwarded in different packages, each holding a different quantity of the particular article.

The following list shows the various methods of packing and the quantity of each type of ammunition carried in a vehicle:

<i>Ammunition.</i>	<i>How packed.</i>	<i>Weight.</i>	<i>Rounds per Wagon.</i>
13-pounder Q.F.	Box of 4 rounds.	91 pounds.	441
18-pounder Q.F.	„ 4 „	118 „	108
4.5-inch howitzer.	„ 2 „	96 „	66
5-inch „	{ 120 cartridges in case.	136 „	} 46
	{ 2 shells in a box.	119 „	
60-pounder B.L.	{ 12 cartridges in case.	163 „	} 40
	{ 1 shell in sling.	62 „	

A 3-ton motor lorry can carry either of the following loads: 280 13 or 15 pounder, 225 18 pounder, 120 4.5-inch howitzer, 100 5-inch howitzer, 80 4.7-inch, 90 60-pounder, or 80,000 rounds .303 S.A.A.

Rifle and machine gun ammunition is packed in boxes containing 1,000 rounds in clips of five, weighing 80 pounds, or 20 bandoliers of 50 rounds each, in clips of five, weighing 75 pounds. In addition there are a few marks of rifle ammunition packed in boxes which only contain 840 rounds each, but which are not commonly used on active service. The capacity of the various types of vehicles carrying S.A.A. is as follows: Pack-saddles, 2,000; limber wagons, 6,000; G.S. wagons, 40 boxes of 1,000 or 45 boxes of 840 rounds; 3-ton motor lorries, 80,000 rounds.

Pistol .45 ammunition is packed in boxes containing 276 rounds, but since the quantity carried in the field is limited, owing to the small number of pistols in use, no definite loads for transport have been laid down. A box of pistol ammunition weighs $16\frac{1}{4}$ pounds.

Ammunition is forwarded from the munition factories in England to the base, under the direction of the Director of Ordnance Services at the War Office, according to the direction of the Q.M.G. The stores are shipped overseas in a similar manner to all other supplies, with the exception that the nature of the shipments will invariably give them precedence over other cargoes. On arrival, the ammunition is handled by the Ordnance Service, collected at the Base Ordnance Depots, and forwarded as required to the Advanced Ordnance Depots, from which it is shipped to the front direct. The chain as far as railhead is similar to all supply chains, and needs no repetition in this lecture, the matter having been fully explained in our lecture on Supplies, coupled with the Transportation lectures.

The quantity to be carried on the lines of communication

is fixed according to a regular table. For every gun, rifle, machine gun, and pistol in the field, a certain fixed quantity is carried, not only on the lines of communication, but also in the field. Under no circumstances may this quantity be allowed to drop below the figure stated. In the field additions to the quantity mentioned cannot be carried, since the available transport will not allow carriage, but on the lines of communication an increase may be maintained with the consent of the Commander-in-Chief, given through the I.G.C. The shipments to railhead are made in accordance with the demands passed through the I.G.C., and as these demands may be urgent in filling, loaded trains carrying the various types of ammunition are usually carried on the lines of communication and held at the various regulating stations under guard, until the demand requires them to be sent forward to railhead.

At railhead the ammunition is taken over by the road transport and carried forward. These transports must always be held full and ready for any emergency. Certain rules govern the Commander of every ammunition reserve, and since these rules apply to every Officer charged with the care of ammunition, even down to the pack animals with a company of Infantry or squadron of Cavalry, it is important that every Officer and N.C.O. should make himself thoroughly acquainted with the system of supply.

There are one or two principles about ammunition that must be remembered by every soldier. The first is, that ammunition is common property and must be issued on demand to any responsible person. The second, that ammunition must always be fed from rear to front, the soldier never turning his back on the enemy in order to obtain ammunition. Another rule that must be observed is, that preparations for replenishing ammunition must be made

before troops advance, and the arrangements explained to all concerned.

We may here diverge for a few moments to impress upon the Officer concerned a few salient facts in regard to the importance of the last rule.

A soldier going into battle will normally carry 200 rounds upon him, and an extra 100 rounds will be carried in the regimental transport divided between the pack animals and the limber wagons. For every rifle in the unit, therefore, there is an immediate reserve of 300 rounds available between the firer and his own regimental limits. Now the modern magazine rifle lends itself to very rapid fire. A well-trained soldier can fire 25 rounds per minute. Allowing the heat of the rifle, fatigue of the soldier, and general moral exhaustion during the excitement of battle, the rate of fire will drop, but one can readily grant a rate of fire of 10 rounds per minute as an average. From this we shall see that in thirty minutes the soldier will have exhausted the supply allowed for his rifle, not only upon himself, but also in the regimental reserves. The question may be asked why the transport is not therefore increased. Mobility is an important factor with the Infantry, and an increased transport for ammunition means an increased transport carrying forage and rations for the animals and drivers; and as this increase must be carried right down the chain of supply for every article needed by the driver and animal, the tonnage added to the unit becomes unmanageable. The output must be overcome by other means, and these means are simple, have been proved in all circumstances of modern warfare, but depend upon a thorough knowledge of the routine system of ammunition supply by everyone charged with the duty of administering it. The human factor, one of the most uncertain factors in war, therefore enters into our calculations. As far as regulations can overcome possible delinquencies, this

is done. All that has to be learned and understood are the following simple rules. These rules apply to all Commanders of any ammunition reserve :

(a) As soon as a reserve takes position, communication must be opened up and maintained by the Commander with every unit which he has to serve.

(b) An orderly must be attached to each of those units to act as guide, who will make himself familiar with the route back to his own unit.

(c) Communication must be established and maintained back to the source of supply.

(d) Every empty vehicle must be *immediately* refilled from the next reserve in rear, this rule applying from the pouches of the soldier to the motor lorry miles in rear.

(e) Ammunition must be issued on demand to any responsible person.

(f) Receipts should be prepared in order to avoid delay when sending ammunition within the fire zone.

By these rules it will be seen that every Commander of an ammunition reserve has to maintain three distinct lines of communication, whereby the possibility of any interference of the enemy is reduced to a minimum. In the first place he utilizes any method of intercommunication that the circumstances will permit to establish communication with the units he serves. He supports this by sending an orderly from his own unit to each of those units in advance and he then throws back a chain of communication with his own source of supply. When the battle starts he commences with a fixed quantity of ammunition under his control. As soon as any vehicle is emptied he must immediately refill it from his own reserves in rear, so that if a battle lasts for a month or a year his supply should be the same at the end of the battle as when he started, with perhaps the exception that one vehicle is waiting the advancing

transport to refill it. The system in operation works in this manner:

As soon as a vehicle in advance is emptied, the Officer or N.C.O. in charge will make a demand on any kind of paper, stating his requirements in any form, either as so many boxes or rounds. He will give this note to the orderly, who, being acquainted with the route, proceeds back to his original unit, and hands the demand to the Officer in charge. This Officer then details the necessary loaded transport to proceed with the guide back to the unit making the demand. He carries with him the prepared receipt, and as soon as he arrives he either transfers his load to the empty transport in advance, or, if under heavy fire, he avails himself of the standardized equipment supplied to our troops and unhitches his own team, the team of the empty vehicle being likewise unhitched, and without any adjustment being necessary the teams are changed and the wagons substituted one for the other, when the now empty vehicle from the rear is taken back to the reserves behind. The same procedure is followed by each of these reserves until eventually the demand reaches railhead. From railhead the demand is either fed from waiting reserve or trains sent to railhead to meet the demand. The demand proceeds down the lines of communication through the various bases, each making its demand from the reserve behind it, until eventually the demand reaches the munition factories in England.

Where the enemy fire prevents any unit from reaching its own reserve, it can draw from any other reserve with which it can establish communications, and as ammunition is common property, the demand will be met.

In this way it will be seen that as soon as a demand is made in the firing-line an endless chain is put into operation, and immediately a forward movement commences from one unit to the other, so that the requirements of the firing-line

are met instantly, without regard to the length of time over which the demands may be received or the quantity consumed. At the finish of the battle also, there is the same proportion of ammunition available as when the battle commenced, so that the units are ready to move forward without delay.

The manner in which the various ammunition parks and columns are distributed in battle depends upon the nature of the country. They are dividable into sections, and having a separate headquarters, that part of the unit will usually be established at a fixed point, to which communication will be established as has been explained. The sections may be pushed forward in advance of the headquarters, so that they are in closer touch, whilst the demand of the forward unit can be communicated by the headquarters in rear to their own reserve, anticipating the return of the emptied vehicle. In this way the necessary transport to refill it will be on the way forward to the headquarters, from which it is redirected on to the refilling point. The method of communication must vary with the circumstances, but usually permanent lines are used near the rail, and where the battle position is more or less permanent, cable or other lines may be laid to meet requirements. As we get nearer to the firing-line, however, the use of visual or other movable equipment becomes necessary.

The chain of ammunition supply seems rather complicated at first sight, but if it is remembered what the allotment of units to a formation are, and that no unit carries ammunition other than that needed by the units in advance, the chain can be easily mastered.

We shall take the Infantry division first, since a good knowledge of its working will enable the chain of the other formations to be learned without effort.

For every army in the field there is allotted a large park,

which may be inserted into the chain if the distance to be covered warrants its use, or it may be held in hand as a reserve, only to be used in case of emergency. This unit is the—

General Headquarters Ammunition Park.—This unit is allotted to an army, and may be either lines of communication or army troops, dependent upon its area of operation. It consists of a headquarters and three sections. It is a very large unit, having 105 3-ton lorries for carrying the ammunition, exclusive of the extra vehicles for spares, reliefs, first-aid, workshops, etc. The lorries are distributed as follows: No. 1 Section, 25; No. 2 Section, 30; and No. 3 Section, 50. It may be used to carry any ammunition needed by the force it serves, and can be used in echelons. Thus, No. 3 Section may provide a refilling section to replenish the stores of Nos. 1 and 2 Sections. Where it is not used in the chain owing to the short distance between railhead and the advanced troops, it may be held as a mobile reserve to meet any emergency, and would be thrown into the chain by the Army Headquarters when the need arose.

Army Corps Headquarters Ammunition Park provides the next link in the chain, and consists of a headquarters and the ammunition sub-parks allotted to the divisions in the corps, usually three in number, when massed together as the corps supply. The supply of ammunition for the corps is thereby regulated through one headquarters, and any supply which is not in immediate use may be utilized for the benefit of the corps as a whole.

Ammunition Sub-Parks are allotted in the proportion of one sub-park to each division. They are corps troops moving under the direction of the last-named unit. They consist of a headquarters and two sections. No. 1 Section carries 280 rounds of 13-pounder and 3,600 rounds of

18-pounder in 16 3-ton lorries, whilst No. 2 Section carries 480 rounds of 4.5-inch howitzer ammunition and 840,000 rounds of S.A.A. The Headquarters carries explosives for the Engineers and technical stores for the Artillery in 3 3-ton lorries. The unit serves an Infantry division, and therefore carries what is needed for that division. This unit is the connecting-link between the division and the lines of communication or army supply.

Divisional Ammunition Columns are allotted as a part of an Infantry division in the proportion of one per division. It is responsible for the division of ammunition between the units within the division. It consists of a headquarters and two echelons. "A" Echelon is the forward echelon, and is divided into three sections, each being organized exactly the same as the other. They consist of a certain number of G.S. wagons and limber wagons supplying direct to the Artillery first-line wagons and to the regimental wagons of the Infantry. "B" Echelon is organized in one section, and provides a relay to refill the wagons of the three advanced sections of "A" Echelon.

Each Artillery gun is served by two first-line ammunition wagons, which accompany it into action, and which refill the limber attached to the gun.

The Infantry units are supplied by regimental wagons which are allotted to a battalion, from which the supply is carried forward successively by two pack mules per company, thence by supporting troops or ammunition carriers to the firing-line. Whenever any reserves or supports are thrown into the line, therefore, they must be issued with extra ammunition, since the difficulties that confront the advanced troops in regard to negotiating the last few hundred yards have never been satisfactorily overcome. This zone is fire-swept, and unless there is dead ground under cover of which fresh supplies can be brought up, or darkness offers

a cover, it is very difficult to get ammunition brought up over the immediate area behind the firing-line.

Reference to the accompanying charts will help to make this chain of ammunition supply clear. It is important that each Officer and N.C.O. should be acquainted with the chain within the division, as frequently one or other of the units will be thrown out as a result of the enemy fire, and it will then be necessary for the unit to get into touch with the next reserve, either through a flank or by covering the distance of the breach.

There has recently been created a force of Field Artillery known as Army Artillery Brigades, to each of which there is attached an ammunition column. In the case of these units the chain of supply is through the sub-park *direct* to the Brigade Ammunition Column which supplies the regimental transport.

In the case of Cavalry formations, each Artillery brigade has a Brigade Ammunition Column attached to it, which supplies the Artillery brigade and also two Cavalry brigades. The Ammunition Column is organized into two sections, each of which has a proportion of wagons for S.A.A. and Artillery ammunition, the total transport provided being 18 limber and 20 G.S. wagons for ammunition. A Cavalry division has no divisional column.

The chain of ammunition supply for a Cavalry division is as follows:

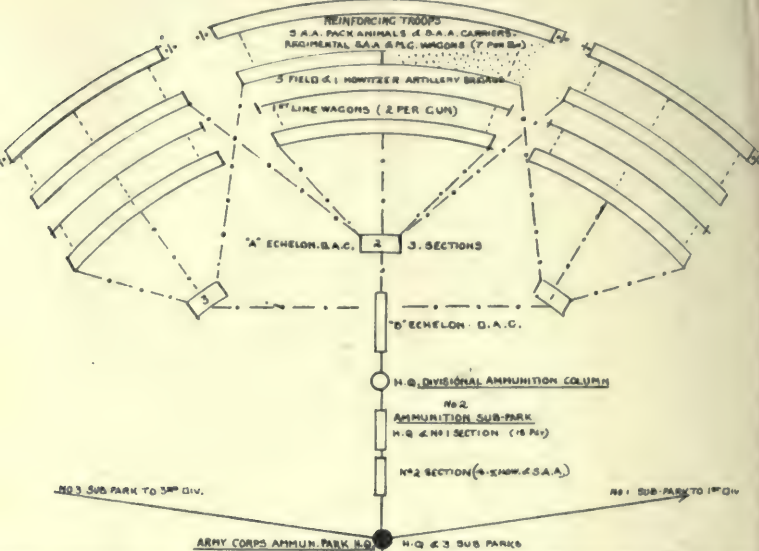
Cavalry Ammunition Park which draws supplies from railhead and carries direct to the field formation. This unit has a headquarters and two sections. No. 1 Section has 13 3-ton lorries for Artillery ammunition, and No. 2 Section, 10 3-ton lorries for S.A.A. Headquarters has 2 3-ton lorries for technical parts, stores, and explosives.

The Cavalry Ammunition Parks transfer their supplies

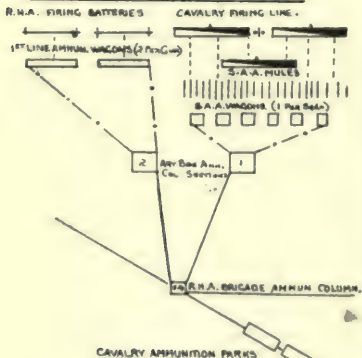
AMMUNITION SUPPLY.

INFANTRY DIVISION.

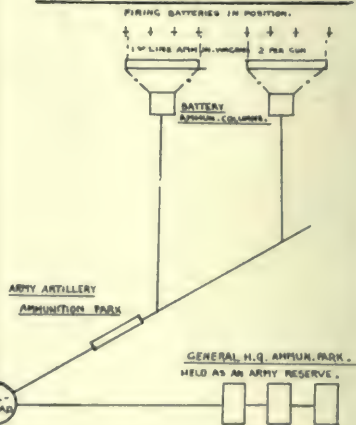
3 INFANTRY BRIGADES (FIRING LINE & H.Q. SECTIONS.)



CAVALRY DIVISION.



HEAVY & SIEGE ARTILLERY.



G.R. McCollum
1918

into the Brigade Ammunition Columns, which in turn transfer their supplies into the Squadron S.A.A. wagons with the regiment, from which it is carried to the forward positions by pack animals. The Artillery draw their supplies from the Brigade Ammunition Column through their first-line wagons, and thence from the limber attached to the gun.

The Heavy Artillery, and likewise the Siege Batteries, have their own columns, which supply their needs. These units are either army or corps troops, and since their ammunition is very heavy, it is necessary to provide them with special transport in the form of

The Army Artillery Ammunition Parks, which have a headquarters and two sections each. Each section carries 13 3-ton lorries for the supply of ammunition, whilst headquarters has 1 3-ton lorry for stores. These units transfer their supplies direct to the *Battery Ammunition Columns* which accompany each heavy or siege battery.

In the case of corps and army troops, sub-parks are attached for the supply of ammunition if the numbers warrant their use, in which case the ammunition is taken direct into the area occupied by the troops and transferred to the regimental wagons.

Ammunition Columns are manned by the Royal Artillery, and from the columns all casualties in men and animals are replaced in the batteries and brigade ammunition columns. The Ammunition Parks are A.S.C. units, and have only a small proportion of Artillerymen with them to handle the ammunition; therefore they do not provide a reserve of men or animals. The Ammunition Columns are manned by trained gunners for this reason, and the horses are usually trained in battery work, in order to adapt them to emergencies.

The Engineers draw their supplies of explosives from the Ammunition Columns with the formations, these supplies being usually carried with the headquarters of the ammunition unit.

The quantity of ammunition carried and the distribution is shown in the accompanying table, whilst the charts illustrate the system of forwarding supplies.

TABLE VIII.—DISTRIBUTION OF AMMUNITION.

Armament.	FIGHTING UNITS.				ARMY OR CORPS UNITS.			TOTAL. <i>Exclusive of the L. of C. Res.</i>
	<i>On Soldier.</i>	<i>Regt. Trans.</i>	<i>Bde. Amm. Col.</i>	<i>Div. Amm. Col.</i>	<i>Amm Sub. Park.</i>	<i>Cav. Div. Park.</i>	<i>G.H.Q. Park.</i>	
<i>Per Rifle.</i>								
Cavalry ..	100	100	80	—	—	100	—	380
Div. Cavalry	100	100	60	40	50	—	50	400
Artillery ..	50	—	—	—	—	—	—	50
Engineers ..	50	50	—	—	—	—	—	100
Infantry or Pioneers	120	100	—	100	50	—	50	420
A.S.C. ..	20	—	—	—	—	—	—	20
A.O.C. ..	20	—	—	—	—	—	—	20
<i>Per Machine-Gun.</i>								
Cavalry ..	3,500	16,000	6,000	—	—	6,000	—	31,500
Cav. M.M.G. Btry. ..	5,400	5,250	14,850	—	—	6,000	—	34,500
Infantry ..	3,500	8,000	—	10,000	3,000	—	3,000	27,500
M.M.G. Btry.	5,400	52,50	—	10,850	3,000	—	3,000	27,500

<i>Artillery.</i>	<i>With Battery.</i>	<i>Bde. Amm. Col.</i>	<i>Div. Amm. Col.</i>	<i>Amm. Sub- Park.</i>	<i>Cav. Amm. Park.</i>	<i>Army Art. Park.</i>	<i>G.H.Q. Park.</i>	<i>L. of C. Park.</i>	<i>Total.</i>
<i>Per Gun.</i>									
15-pdr. R.H.A.	176	76	144	—	150	—	—	454	1,000
15-pdr. B.L.C.	250	144	144	75	—	—	—	387	1,000
18-pdr. Q.F.	176	—	202	75	—	—	75	472	1,000
4.5 ⁵ How. Q.F.	108	—	92	40	—	—	40	520	800
5" B.L. How.	112	46	92	75	—	—	—	475	800
4.7" Q.F. ..	80	80	—	—	—	40	40	260	500
60-pdr. B.L.	80	80	—	—	—	45	45	250	500
13-pdr. Anti- aircraft ..	80	—	—	280	—	—	—	—	360
18-pdr. do. ..	176	—	—	—	—	—	—	—	176

NOTE.—S.A.A. is allotted on assumption of 500 rifles per Cavalry regiment, 1,000 rifles per Infantry or Pioneer battalion, and 400 rifles for Divisional Mounted Troops. Other units are not considered.

For Heavy Batteries read "Bde. Amm. Col." as "Battery Ammunition Column."

18-pounder anti-aircraft batteries obtain their reserves from Field Artillery supply.

CHAPTER XVI

PERSONNEL AND REINFORCEMENTS

Peace Reserves—War Establishments—Mobilization—System of Concentrating—First Reinforcements—Subsequent Reinforcements—Reporting Casualties—Demands from Base—Base Depots—System of Forwarding—Employment of Civilians—Grading and Pay, Records of—Identification.

PROVISION AND SUPPLY OF PERSONNEL.

In time of peace the Army of the British Empire consists of a Standing Army and certain Reserves which are utilized in time of war to bring the force from a peace to a war establishment. The Overseas Dominions are responsible for their own military forces, with the exception of those Dominions wherein a standing British garrison is provided.

The introduction of conscription into the laws of Great Britain has materially changed the situation as regards reserves of man-power, and since the future arrangements have not yet been settled upon, we shall only speak of the system whereby the reserves, from whatever source they may be obtained, are brought into the Army, and how subsequent losses are provided for.

The Standing Army is composed of a body of troops, fixed as to size, establishment, etc., according to the authorized peace strength, which is actually undergoing training, and which is maintained in a condition of readiness at all times. These troops form the nucleus of any force which may be used for defensive or offensive purposes.

The Reserves, of which there may be several grades, are formed from those men who have previously been trained, and who may be called upon to perform a given period of training in each year or at stated periods. These Reserves are graded in respect of the length of time they have been away from the Colours, regarded more in the military sense, from the point of view of their subsequent loss of efficiency. These Reserves are subject to recall immediately upon the order of mobilization being sent forth.

As soon as the political situation becomes sufficiently tense as to make war appear inevitable, the Government becomes responsible for notifying the Military Authorities as to possible developments, for which they prepare. Either before or as soon as war has been declared, the order for mobilization of the forces is issued by Royal Proclamation, when the Standing Army is brought to war establishment by the absorption of the Reserves who return to the Colours.

In order to facilitate the mobilization of the Army, the importance of which has been emphasized in previous lectures, certain preparations are made in time of peace. These preparations must cover a multitude of details, which become important in the stress of mobilization. We shall only deal with those relating to the actual supply of the extra forces required for mobilization in this lecture.

As every soldier completes his time with the Colours and is passed to the Reserve, his measurements are taken, to obtain the size of clothing required by him on his return, and certain documents, which we shall explain later, are prepared. To the Reservist is awarded a number, which is also used in all references to the Reservist. In the mobilization stores a suit of military clothing, equipment, etc., is stored for the Reservist, the receptacle being marked with his number and placed in the series to which that number

belongs. The documents are filed in the office of the Record Officer of the unit, ready for issue when required.

The documents maintained for every Reservist are as follows:

- A.B. 64, Active Service Paybook.
- A.F. B.103, Active Service Casualty Form.
- A.F. B.122, Field Conduct Sheet.
- A.F. D.418, Statement regarding issue of Separation Allowance.
- A.F. D.455, Identity Certificate for wife and children.
- A.F. 463, Notice to join, which is a travelling warrant and a cash order.
- 2 Identity Discs, stamped with number, name, rank, and religion.

These are the forms issued for a soldier proceeding on active service, and maintained ready for issue on arrival.

In addition, each unit preserves certain documents relating to the unit as a whole. They consist of the following:

- A.F. D.442, Return of Reservists to rejoin.
- Posters calling out the whole or part of the Reserve.
- A.F. O.1796, Forms for allotments of pay.

The Commander of every unit will have in his possession also the War Establishments and Mobilization Equipment Regulations before referred to.

The order for mobilization may call up the whole or only a part of the Reserves. As soon as the order is received, the notices to rejoin are handed to a Post Office by the O.C. unit, and are despatched to the soldier, whilst posters calling out the part of the Reserve affected are circulated broadcast.

As soon as the Reservist receives his order to mobilize, he returns to his unit, using the travelling warrant attached to the notice to rejoin, and in order to provide him with the

necessary funds to maintain himself, a cash order for the sum of three shillings is attached, which he can cash at any Post Office. The name of the place to which he is to report being marked on the notice, he obtains the necessary ticket for transport and reports to the place of joining. He is then subjected to a medical examination to ascertain whether he is fit for active service, home service, or unfit for service, a medical certificate being signed by the Medical Officer and passed to his orderly room, where it is attached to the papers held for each soldier.

After passing the medical examination, the soldier is directed to the Mobilization Stores, where he is issued with the set of clothing and equipment held for him, which he immediately dons, either sending his civilian clothing back to his home (paper and string being provided for the purpose), or leaves it at the depot, though at his own risk.

As the Reservists arrive they are taken on the strength of the unit, if it is at the place of joining, or are marshalled into groups and sent, under an Officer, to the place where their regiment is mobilizing.

The O.C. unit will meanwhile make preparations for the issue of war equipment, and for the reception of Reservists rejoining. The required number to bring his unit up to war establishment is provided by the incoming drafts, which he absorbs and takes upon his strength. Their equipment is issued to them, and as soon as the unit is complete he wires this information to the War Office.

Each unit mobilizes its first reinforcement at the same time as the unit is formed. This consists of 10 per cent. of the strength of the unit, and when the number of other ranks exceeds 100 an Officer is attached. This first reinforcement is known as the "Base Detail," and is trained with the unit, so that it offers an immediate reinforcement when required. When the unit moves over-

seas the Base Detail may accompany it if the theatre of operations is distant, or it may be left at the Home base. In any case, the Base Detail is left at the base of operations for the unit.

The Reserves which are not taken with the first force are held at the depots, undergoing training to bring them to a state of physical and military efficiency. These depots are organized on a regular establishment, and consist of Infantry and Cavalry depots which supply certain units in the field, or in general depots which supply arms of the service such as the Engineers, Artillery, Army Service Corps, etc. The establishment of the depots varies according to the number of units which it serves.

The principle upon which the forces at the front are reinforced is that the reinforcements must anticipate the demand, and therefore there must always be a draft available for service.

The losses in the various arms have been tabulated, and the general requirements of each arm of the Service fixed. Naturally, the loss is heavier in the Infantry than in any other arm. Experience has shown that the loss increases in ratio after the sixth month, due to the collapse of men who have been suffering with minor ailments. Consequently the proportion maintained ready for the field may be increased according to possible requirements.

The calling up of subsequent Reserves is carried on after the first forces have taken the field, and must be sufficiently far ahead of the demand to allow the soldier to be trained; and the longer the soldier has been away from the army, or the less the amount of training he has received, the longer will be the period of training which he must undergo before he is available for draft.

The units having proceeded overseas, and the first reinforcement assembled at the base, the troops are moved

forward by easy stages, in order to gradually accommodate the Reservists to the strain. After a time the first casualties will occur, when the demand for reinforcements must be made. Since this demand will be made from the forward unit, we must now study the question from the point of view of the O.C. unit.

At the first opportunity after a battle, every Commander will call the roll of his men, and ascertain what his effective fighting strength is. His first care is to maintain that strength.

Information as to losses is furnished in two forms; they are as follows :

States, in which speed in rendering the report is more essential than accuracy, and which consists of a statement in figures; and

Returns, which are forwarded when more time is available, and which must be accurate, since they form the basis of records.

States will be fully explained in our lecture on Records, but for this lecture it is sufficient to say that the first demand will be made in a state which is forwarded direct from Corps or Divisional Headquarters, according to previous instructions, to the I.G.C., and for purposes of record to the D.A.G. base.

The I.G.C. forwards his demand for reinforcements to the Base Depot of the unit, and arranges for transportation, etc., to bring them to the firing-line.

If the casualties have been particularly heavy, and the fighting efficiency of a force has suffered thereby, it is the duty of the Commander of the unit to call the attention of the Commander of the formation to the fact, in order that the unit may be replaced in the firing-line, or that special measures may be taken to fill the vacancies, either by

reinforcing them from other bases, or by making a call on such available Reserves as the depot of the unit may have.

We may now return to England and take the movement of the draft in detail.

As soon as a draft is marked as efficient, it is fully armed and equipped for service. The men are usually given a draft leave of four or five days. They then report to their unit previous to departure. Their kit is inspected to see that it is complete, and upon receipt of orders they are issued with rations sufficient to carry them to their destination if the journey is short or, if the journey is long, sufficient to cover the day of their arrival at the ship. They are then marched to the station and entrained. If there is an Officer with the draft, he will carry the necessary documents; but if not, they will be carried by a Draft Conducting Officer. The Officer must have the necessary parade states for entrainment and embarkation, nominal roll of the draft in duplicate, and a copy of the order authorizing the move. Armed with these documents, he escorts his draft on the train and, following the routine which was previously described, on to the vessel. On arrival at the Overseas base, the M.L.O. will give any orders as to the future movements of the troops which he may have received, and will demand the nominal roll, disembarkation state, and medical certificate of the draft. The draft, when authorized by the M.L.O., will be disembarked, and will then proceed to a Base Depot.

Base Depots are established on the lines of communication for the reception of all drafts, and usually a reserve of men is carried at the Base Depot. The O.C. Base Depot receives his orders from the Administrative Commandant of the Base, and, acting on his orders, will maintain such reserve as may be directed. All calls for reinforcements are forwarded through the I.G.C., and by him to the Administrative Commandant,

who in turn passes them to the depot concerned. As soon as a draft reduces the number of men below that fixed by the I.G.C., the necessary drafts are called from England in order to complete establishment.

Our draft having arrived, it is taken on the strength, the nominal roll being demanded and checked against the parade state. This nominal roll is forwarded to the D.A.G. Base for record, and by its use every man entering the country is enrolled on the strength of the field forces. The application of the various documents forwarded to the field will be explained under the lecture on Records.

The kits of the men are inspected, and any surplus kit is left in charge of the Base Depot. The men are then placed in training until such time as they are required at the front.

The state before referred to as being furnished by the Commander of the unit in the firing-line is forwarded to the I.G.C., who in turn passes it to the Administrative Commandant at the Base. This Officer passes his instructions to the O.C. Base Depot, and in accordance with the instructions received, the draft is supplied with rations sufficient to carry it to the unit, and for the balance of the day of arrival, and then proceeds by rail to the railhead, where it may be taken forward by specially allotted transport, etc. (omnibus companies), or it may march by road to the headquarters of the formation to which it is to go, from which it is redirected on to the unit.

The evacuation of the sick and wounded will be explained later, but men who have been invalided from the field pass through the hands of the medical authorities and are returned to England for treatment. They subsequently pass through convalescent depots to fully recuperate, and after a short leave return to their units, where they are again available for service, provided their medical category shows them to

be fit. In turn they again pass through the chain of supply for personnel, and become part of a reinforcing draft.

There are one or two exceptions in regard to the supply of personnel to the forward unit, notably in the case of Artillery units in the field, which are fed from the unit in rear and are gradually fed forward into the advanced unit. This occurs particularly in the case of the members of the batteries. These men are replaced from the Brigade Ammunition Columns, their places being refilled from the Divisional Ammunition Column. The latter unit receives its reinforcements from the base, and eventually passes the men forward to the battery.

EMPLOYMENT OF CIVILIAN PERSONNEL.

The employment of civilians with the field forces is intended to increase the fighting strength of the forces by utilizing civil labour for purely administrative work. The classification of civil labour may be as follows:

- (a) Civilian officials and employees.
- (b) Civilians permitted to accompany an army.

The first classification includes all employees and officials who are engaged on contract or by enlistment. The second class is restricted to Press correspondents, cinematograph operators, and other persons who are permitted to accompany an army in the interest of any private organization or concern.

All civilians employed with a field army must be registered or attested, and furnished with a pass. Those who are attested must wear uniform or some distinguishing badge whereby they may be recognized as part of the forces. Any civilian who has not been attested is forbidden to wear any article of uniform issued to the troops, and enforcement

of this rule becomes very important where native labour is employed, owing to the tendency which they exhibit to obtain and wear articles of uniform in imitation of the troops with whom they are associated.

Any civilian who is not in uniform must be furnished with a pass or licence. This pass or licence is issued on a recognized Form and must bear the following information:

Name, Nationality, Country, Town or Village, Occupation, with description whereby the person can be identified. This may include a photograph, across which the signatures of the issuer of the pass must be written in order to avoid substitution, with particulars of the height, approximate age, colour of eyes and hair, and any distinctive marks which will establish identification.

The pass is signed by the person for whom it is intended, and is then countersigned by the Commander of the area in which the civilian is employed, or by any authorized representative. Usually the pass is countersigned by the Provost-Marshal.

These passes are periodically inspected, and are liable to be cancelled at any time. They do not authorize the holder to exercise any military command over regularly enlisted troops, nor do they furnish right-of-way through outposts or other battle positions without the written consent of the G.O.C., or his authorized representative. The passes are registered in a book kept for the purpose by the Provost-Marshal of the formation or area.

Casual passes to traders, sutlers, agents, etc., may be signed by a Provost-Marshal, subject to such limitations regarding their issue as may have been given to him. As a general rule the P.M. will not be given permission to issue

passes in an area which is in close proximity to the fighting forces.

Whenever any civilian is dealt with for any offence, or when any other matter of importance affecting his employment with the forces may occur, the particulars are endorsed on the back of his pass, and are signed by the officer dealing with the matter.

All civilians employed with the troops will be graded according to their ability, and a fixed tariff of wages will be issued by which their rates of pay will be allowed. These rates must be promulgated in orders and the ratings specified for the information of all concerned. The allowance of forage, rations, etc., granted to civilian employees will be similarly fixed, and no issues will be permitted without this authority.

The granting of any particular rating does not give the bearer any rights or privileges in regard to military command or precedence, or entitle him to wear uniform.

The rates of pay granted to civilians will depend upon the class of labour which they are capable of giving, and for which they are employed. In every case where a civilian is engaged as an artificer or mechanic, proof of his ability should be given before a competent person before he is engaged. The particular trades should be similarly graded according to their value. The different standards of efficiency for assigning pay should be fixed by the authority understanding the particular trades, and should be made with due regard to the current rates of pay within the area in which the work is to be performed, rather than to that of the customary rates in England. Unskilled labour may be formed into one grade in which the hours of service and rates of pay alone will need to be defined. Allowance must be made, however, for the necessary gangers or headmen, for whom there should be a higher rate of pay.

Authority to engage civil labour will usually be confined to the lines of communication under the authority of the I.G.C., who may issue orders regarding the employment of necessary labour by the different Administrative Services. The extent of the authority of the different Officers will be clearly explained to them, and they then become responsible that the labour is economically used, and that the limitations are not exceeded.

Natives engaged for service with a field force, such as carriers, drivers, etc., will usually be obtained by the Staff of the formation concerned, but if necessary they may call upon the I.G.C. to provide them.

In engaging civil labour, an employment office may be formed, which will be situated in the most convenient place, and labour depots may be established from which the acquired labour will be distributed as required. The employment office or the labour department from which the labour has been despatched will be the base of the individuals for all purposes of record, pay, etc.

In engaging the labour, contracts must be made and clearly explained to the civilian, after which he should be required to sign the same. The terms of the engagement must be definitely stated in the contract, and no promises in regard to promotion, increased pay, extra grant or gratuity, may be included. Any subsequent advancement of pay or position will be strictly controlled by the merits of the employee, and must be decided by the Officer under whom he is employed.

Temporary labour, employed by the week, day, or hour, may be engaged by authorized Officers for casual work at a point where the necessity of a definite contract may not be so important. At bases labour for loading and unloading trains, ships, etc., may be thus employed, but where the work is constant it is better to make a definite contract,

provided there is a good possibility of the same being observed.

Authority for these temporary engagements must be published in local orders, and rates of pay, grade, etc., established as for longer contracts.

In the case of native labour, the contract will usually be made with a headman or tribal chief, who becomes responsible for the provision of the required numbers, and usually for their employment whilst working under contract.

All unskilled labour should be organized into sections and companies—gangs of 25 to 30 labourers under a ganger being the working force, these gangs being massed again into sections, and finally into companies of 500 under an English Officer and N.C.O. The original formations should be rarely broken up.

Each native should be supplied with a metal disc to be worn around the neck, bearing a number, and the number or other designation of the unit to which he belongs. The various classes should be marked by coloured armlets for the different trades.

Nominal rolls must be kept of every civilian employee by all labour companies or smaller units, and by every employment office or labour depot. The system of keeping records will be governed by the local conditions, but full particulars should be kept wherever possible.

Civilians employed regularly are entitled to certain grants, pensions, and gratuities, but no claim can be considered for any temporary employee.

The Commander-in-Chief may authorize the employment of native followers by members of the forces, but will issue orders as to their control. They will be registered and furnished with a pass, exactly the same as any other civil employee.

Press correspondents, photographers, moving-picture

operators, or other authorized agents of recognized organizations may be granted permission to accompany the field forces by the Commander-in-Chief. They will be issued with a special licence, which will be signed or countersigned by the Chief Field Censor or his representative. The organization which the individual represents must be mentioned on the licence, which must be produced upon demand. Such agents may be permitted to have one servant to accompany them, who will likewise be furnished with a pass. The name of such servant will be noted on the licence of the correspondent, etc. Should the correspondent or agent be an ex-Officer of the Army or Navy, he is not permitted to make use of his military rank whilst engaged as a civilian attached to the Army, nor may he use that name in regard to any matter, etc., which he forwards to his organization.

The limitations as to area to which these agents may be admitted will be regulated by the General Staff of the formation to which they are attached, and all orders regarding the control of privileges will be issued through that branch.

CHAPTER XVII

MEDICAL SERVICES IN THE FIELD

Preservation of Health—Duty of Medical Officers—Sanitation and Hygiene—Effect of Age and Service on Health—Statistics of Previous Campaigns—Sanitary Organization on the Lines of Communication and in the Field—Responsibilities of Officers and N.C.O.'s—Prevention better than Cure—Precautionary Steps.

THE Medical Services in the field have four distinct duties to perform. They are—

- (a) The preservation of the health of the troops.
- (b) The professional treatment and care of the sick and wounded.
- (c) The replenishment of medical and surgical equipment.
- (d) The collection of the sick and wounded, and their evacuation from the theatre of operations.

For the supervision and conduct of these duties the Director of Medical Services is responsible, and to assist him his representatives are situated in every area where troops are quartered, and on every formation in the field, whilst in each unit there is an Officer to look after the particular troops within that unit.

The first duty of the Medical Service is to keep the soldier fit for service. Every soldier who is unfit is an encumbrance to the force, and must be got away from the mobile forces as quickly as possible. If he is likely to recover as a result of immediate treatment, he may be given the necessary

attention and returned to his unit for duty; but if he is not likely to be effective within a short period, he must be treated and evacuated from the field of operations.

SANITATION AND HYGIENE.

The first essential in keeping the soldier fit is to see that he is not subjected to any influence that will undermine his strength. These conditions may arise from the habits of the soldier, carelessness, or exposure, or they may arise from the immediate surroundings being unhealthy, either as a result of the fault of the troops or as a result of natural conditions. The supervision of the conditions under which the soldier must labour is not left to the Medical Services alone, but, as a result of instructions given in the training of Officer and man, is made a matter of duty to all concerned. The proper steps to be taken to preserve the health of all ranks is made a part of the training given to every member of the forces.

The term "sanitation" has been commonly associated with dirt and filth, and is consequently misunderstood, whereas it is in reality a term signifying the preservation of health. This term is used to cover the subject of protecting the soldier from disease in the Army, and its control is one of the measures which the Medical Services are responsible for. By insisting upon cleanliness in the individual and in his surroundings, and by establishing the necessary authority to enable the Medical Service to enforce the sanitary laws, a machinery is created whereby this most important subject can be handled.

The importance of enforcing the strictest laws in this regard can be measured when we stop to think that an army is composed of, perhaps, millions of men and animals, for whom all the normal conveniences of life are absent. This

force must be moved according to the operations, and consequently the convenience of the encampments cannot be considered, unless they be in proximity to the position upon which the tactical situation depends. Unless every precaution is taken, it is inevitable that there will arise a condition that will endanger the health of the whole force. The various agents that cause disease may be of such a type that cleanliness alone cannot overcome the danger. It may be necessary to take other precautions to protect the soldier, as is the case in swamps, where the mosquito is the agent whereby disease is spread. Under these circumstances the Medical Service must protect the soldier by the provision of the necessary chemicals to destroy the pest. Under other circumstances it may be necessary to give the soldier treatment that will render him immune to attack. This is the case with such diseases as smallpox, where the preventative is gained by inoculation of the blood of the soldier with certain combative agents. In many cases it is necessary to combine the protective measures, first by issuing laws against certain practices which offer danger, and then by inoculating the soldier with a protective matter. This is the case with enteric, where the control of the disposal of excreta and of certain contaminated foods or liquids, combined with protection of the system by inoculation, are necessary. In all cases the Medical Service is responsible for studying the cause and effect of the various diseases, and for the necessary steps to minimize the danger.

The effect of diseases upon an army has been illustrated many times in history, and cannot be measured by the actual loss of life, but must be measured by the effect which it produces upon the army as a whole, and the issues for which it is fighting.

In the various British campaigns between the time of the Crimea and the South African War of 1899-1902, the losses

in our forces from disease bore the proportion of nineteen cases to one of wounds by the enemy. During the South African War the average force during the two years was 208,000 men. The admissions to hospital during that period were approximately 404,000, of which no less than 380,000 were cases of disease.

During the Russo-Japanese War of 1904-1905, the admissions to hospital from disease only bore the relation of two cases to one of wounds. This was largely due to the splendid organization of the Japanese forces in regard to sanitation.

We have profited by experience, and to-day every effort is made, not only to prevent disease, but to educate the soldier to appreciate the risks, and by instruction to teach him how to avoid or nullify them.

The age and service of the soldier play a part of much importance in the statistics, and it would appear that as a result of advance in years, and consequently in discretion, coupled with training and discipline, the disposition of the soldier to succumb to disease falls in similar ratio to his service. The statistics which have been kept for many years show that disease is commoner amongst men of eighteen years of age, and of less than one year's service, whilst it is least amongst those of forty and over, having eight years or more service. From this it may reasonably be supposed that much of the sickness is due to lack of care upon the part of the younger soldier, but as his years and service advance he profits by training and discipline.

The principal diseases which affect the fighting efficiency of a force may be classified under several brief headings:

- (a) Those due to disturbance of the functions of the body, affecting the physical condition, such as lack of proper nourishment, intense heat or cold, exposure; or some unknown cause, such as cancer.

- (b) Those diseases which are caused by living germs or organisms which invade the body and produce the disease, and which are capable of being transmitted from one person to another, as in the cases of smallpox, scarlet fever, enteric, etc.
- (c) Diseases which are caused by vegetable or animal parasites, and which are produced from local conditions, such as skin disease caused by certain fungi, intestinal worms, etc.

The protection of the soldier from those under Class (a) is a matter for the Medical Officer on the Staff of the force, who may advise certain measures being taken in regard to the clothing, employment, and protection of the troops in order to reduce the danger, as far as the operations will permit.

Certain restrictive laws might be formulated in regard to these cases, such as orders regarding the wearing of helmets, orders to remain under cover at certain hours of the day, or, again, control of the use of certain liquors or food. These laws would be suggested by the Medical Officer and enforced by the regular chain of command, whilst the M.O. would see that they were being observed, reporting cases for action when detected breaking them.

The cases of the second class require much more legislation and care. In the first place the risk may be negated by submitting the soldier to vaccination, inoculation, or injection of certain counter-agents, usually with the intention of producing a mild case of the disease which offers future protection against the more severe attack. The next measures require the control of all possible sources of infection or contagion. Thus, the known case and all contacts must be isolated, articles which may be infected properly cleansed or destroyed, and all other precautions taken to prevent the spread of the disease. In the third place,

precautions against the disease may be taken by making it an offence to subject oneself to possible infection from known causes of the disease. Vermin may produce typhus; hence orders regarding the cleansing of the person and clothing become necessary; milk and water from certain sources may carry enteric, and therefore must be put out of use; or the breeding of flies from carelessness may produce one of several diseases; consequently, the destruction of all refuse must be strictly controlled.

The control of disease may therefore be effected by rendering the individual immune to attack, controlling known sources of infection, and by preserving the utmost cleanliness, both of the person and surroundings.

The machinery provided for supervising these matters is entirely under the control of the Director of Medical Services and the representatives with the various forces.

On the lines of communication there is established a Sanitary Committee to co-ordinate the work of the different parts. The lines of communication are divided into sanitary sections and districts, each having a Sanitary Officer in charge. The bases are usually established as separate districts. Owing to the lines being more or less permanent, much more effective work can be done than is possible in the field, and as these sections and districts will conform closely to the civil administration as to areas, there will usually be some local conveniences such as sewers, water-supply, etc., whereby the sanitary condition can be considerably improved. The Sanitary Officer in charge is usually an expert, and he has a sanitary squad allotted to him to carry out his orders. He will supervise the food and water supply, disposal of sewage and refuse, disinfection, and all measures to prevent the spread of infectious disease. He reports to the Commander of the Administrative Section or Base. The sanitary squad under his control provides

the skilled labour required in the performance of these duties, and will supervise the work of such labour as may be allotted to the Sanitary Services, and also act as sanitary police for the enforcement of the sanitary laws. For this purpose the men are invested with the authority of military police, and wear a badge to designate their authority.

The sanitary work on the lines of communication conforms very closely to the work of the medical health authorities in time of peace, and they exercise the same authority within the district under their command, utilizing the civil administrative authorities and labour as far as possible.

The sanitary work in the field presents much greater difficulty, owing to the concentration of troops within a limited area and the absence of any local conveniences.

The personnel for the carrying out of sanitary duties consists of Sanitary Officers and their sections with the formations in the field, and the Medical Officer and sanitary squads with the units.

The Sanitary Officers are responsible for the following matters:

1. To exercise general supervision over the sanitary condition of all places occupied by the troops of the command to which they are attached.

2. To watch the health conditions of billets, camps, and bivouacs, and at once investigate the cause of any unusual prevalence of disease among the troops or the inhabitants.

3. Advise on the measures which should, in their opinion, be taken to protect the health of the troops, and report on the adequacy of the arrangements already made for that purpose.

4. Advise on the selection, from a sanitary point of view, of sites for camps and bivouacs, and on questions relating to the sanitary condition of towns, villages, or buildings about to be occupied. To this end they should accompany the

Staff Officers charged with the selection of camps, billets, or bivouacs.

5. Advise regarding the purification and distribution of water for drinking purposes; also in respect of latrines and urinals, burial of the dead, and disposal of refuse and car-casses of animals, etc.

6. Impress on Commanders of units and on Medical Officers in charge of troops the imperative necessity of obtaining the highest possible standard in sanitation, both in camp and on the line of march, and bring to the notice of superior authority any neglect of sanitary measures possible under existing circumstances.

The Sanitary Officer thus acts as medical adviser in these matters to the Commander of the force to which he belongs, and supervises the carrying out of orders issued relating to the subjects under his control, throughout the area occupied by the force to which he belongs. His sanitary section provides him with the medium of establishing the necessary supervision.

The regimental sanitary organization consists of the Medical Officer of the unit, with certain details appointed to act as sanitary police under his control. There is also a water detail, to look after the water-supply and its protection. The strength of these details varies with the size of the unit, but the duties which they carry out are the same in every case.

The Sanitary Police are responsible for—

1. The preparation and care of latrines and urinals, including the filling in of the same and marking of old sites.

2. The systematic collection, removal, and disposal of refuse by burning or other method.

3. The construction of ablution places and the disposal of waste water.

4. The sanitation of cooking places, horse and mule lines, and slaughtering places, in the area occupied by the unit.

The Regimental Sanitary Police are detailed from the strength of the unit, and are vested with the authority of military police for the better performance of their duties. They are under the Regimental Quartermaster for their employment, but the Medical Officer will direct their efforts from the sanitary point of view.

The Regimental Water Detail is posted to the unit from the Medical Corps, the numbers varying according to the size of the unit. They are responsible for—

1. Daily supervision of water-supply and its purification for drinking purposes by boiling, filtration, or the addition of chemicals, as may be directed.

2. Charge of all apparatus and stores connected with the water-supply of the unit.

The Water Detail takes charge of the water-carts with the unit, and the issue of water to the troops. Where natural water-supplies are used, they are responsible for the care of the watering-places, and will regulate the use of same.

The most important factor in the chain of sanitary control is the responsibility placed on every individual for keeping the laws governing sanitation. This responsibility is definitely stated as regards every Officer and N.C.O., who is held responsible for the sanitary conditions in the area occupied by his command, and also for the care of the health of his men. By this regulation every Officer is made the responsible Sanitary Officer in his own area, and consequently he must understand what is expected of him. The matter is commonly supposed to be too technical for the average Officer, and to be the work of specialists; but this is not so, and the regulations are very positive in fixing the responsibility of the Officer and N.C.O.

For this reason it is necessary to go into the details of these

duties very fully, since you are all charged with this important duty. It should be a matter of pride with every Commander that he has not lost a single man from a preventable disease, and there is no doubt that the day is coming when every Officer and N.C.O. will be compelled to offer an explanation of an outbreak within his command. Perhaps it will be as well to define a few of the diseases which are encountered in the army, explaining their causes briefly, and the steps to be taken to prevent their outbreak.

Cholera.—This disease is caused by a germ entering the body, usually in water, but also conveyed in milk. It commences with sudden diarrhoea and purging. The patient has severe cramps, the face is pinched, and the body becomes cold. Death follows rapidly, sometimes occurring in a few hours. On discovery, all suspects should be instantly isolated, and all articles which may be infected collected by the contacts, for the order of the Medical Officer as to disposal. To prevent outbreaks the troops should be warned against all unauthorized water and milk supplies, and from eating indigestible food, unripe fruit, or anything likely to upset the stomach, and avoid excess of alcohol.

Dysentery.—This disease is very prevalent during war. It is caused by a germ conveyed in water, milk, or food, especially such foods as shell-fish. The symptoms are sudden in development, first a frequent desire to stool, severe straining, pain, and passing of slime and blood. To prevent, control use of water, milk, and dangerous foods, and destroy flies, which are carriers. Collect all possibly infected articles and take care of the disposal of excreta, and watch personal cleanliness.

Enteric Fever (Typhoid Fever).—Caused through germs entering the body from water, milk, or contaminated food, and by inhaling germs. This disease is very prevalent in war-time, and is exceedingly dangerous. It is identified by

high fever, pain in the head and stomach, cramps and diarrhœa. Stools are pale yellow in colour, and watery. The germs are very active in all excreta, and the patient may excrete germs for years afterwards. Many mild cases occur which are apt to be overlooked. Therefore all cases of diarrhœa should be sent to the Medical Officer for examination. These cases are just as dangerous as the more severe cases. To prevent the outbreak of the disease, the first and most effective precaution is to inoculate the soldier. This precaution has resulted in a reduction of deaths among our troops in India from 5.83 in 1903 to .30 in 1911, these figures being the ratio per 1,000 cases. The next step is to strictly control all water-supply which has not been passed by the medical authorities, milk, foodstuffs, etc. The destruction of flies is very important, and possible breeding-places of these pests must be removed. All cases of diarrhœa must be immediately sent to hospital. Latrines used by suspected cases must be carefully treated by disinfectants and filled in. All articles used by suspects must be collected and treated by the Medical Officer. The protection of water-supply, especially from animal contamination, is most important. All quarters must be examined closely as regards cleanliness, and frequent examinations made of the men's persons and clothing for the same purpose.

Heatstroke is caused from excessive heat or effort. The predisposing causes are excessive use of alcohol, over-eating, and physical exhaustion. To avoid, the troops must be counselled to abstain from excesses in any form, to relax clothing and equipment on the line of march, and to wear effective covering on the head, shading the eyes and the back of the neck. It can be identified by the pain in the head, fever, flushed face, heavy snoring breathing, and very dry skin. Place the patient in shade with head slightly raised, and remove to hospital.

Malaria.—This disease is caused by germ-carrying mosquitoes which infect the blood by their bite. It is recognized by the alternative stages of cold and pallor, heat and flushing, and profuse perspiration. To prevent, destroy all possible breeding-places for the mosquitoes, use netting around sleeping quarters, destroy vegetation close to quarters, prevent troops getting in close proximity to natives of the district, and use paraffin on all water, especially stagnant pools, etc., in the vicinity of the camp. Protection may be obtained by giving quinine in doses of 5 grains daily, or 10 to 15 grains twice per week.

Mediterranean Fever.—This disease is caused by goat's milk in the areas in which the disease is prevalent. The symptoms are those of high fever, which comes in successive attacks, each lasting from three weeks to a month, with pains in the joints. To prevent, enforce the law that goat's milk must not be drunk. Take usual precautions as to contacts and suspects.

Plague.—This disease is very deadly amongst the natives in India. It is caused by a germ carried by rats from the area of infection, which are communicated to man. It is usually contracted through association with natives who are infected. The symptoms are high fever, swelling of the glands in the armpit and groin, or inflammation of the lungs. To prevent outbreak, control native quarters and forbid access of troops. Strict cleanliness. When detected, prompt action must be taken to prevent spread.

Scurvy.—This disease is generally caused by shortage of green vegetables, fruit, or fresh meat. It is not infectious or contagious. The symptoms are pains in the calf of the leg, general weakness, swelling of the gums later, and marks like bruises on the skin. To prevent, make up deficiencies of diet or issue ration of lime-juice.

Tuberculosis.—This disease is highly infectious, and is

caused by a germ found in milk or carried by the air. The disease is slow in its development. The sufferer is addicted to a hollow cough and much spitting. The sputum is highly dangerous, since it conveys the germ, and upon the sputum drying these are distributed in the air. To prevent, keep rooms well ventilated and remove suspects. Watch for and prevent spitting in all public places. Patients should use their own messing utensils, and should use rags to spit in, the rags being destroyed afterwards.

Yellow Fever.—This disease is caused by a mosquito which carries the germ. The same precautions as for malaria will effectually prevent the disease if strictly observed.

By far the most deadly of diseases as far as loss of efficiency to the army is concerned are the *venereal diseases*. These can only be contracted by actual contact with other cases. The usual method of infection is by intercourse with a diseased woman. Cases frequently occur, however, of infection by the use of utensils belonging to a diseased person. The germ requires an inlet into the blood, and the slightest abrasion is sufficient to inoculate the person with the disease if contact is made with the germ. The far-reaching effect of these diseases needs to be explained to the troops and, for that matter, to the whole world. Education of the soldier in the risks run and strict control of possible places of infection are the best preventatives.

The most dangerous of these diseases is that of syphilis. This disease takes three weeks to develop from the date of contact and infection, and requires vigorous treatment to eradicate the disease. The difficulty of concealment confronts the authorities in regard to venereal diseases, but the soldier must be made to understand the danger of delaying effective treatment. The first symptom is an ulcer which appears upon the skin at some point. This ulcer is definite in its form, and cannot be confused with any other class of

sore. The disease passes through three stages unless effectively treated, the first being that of the outbreak of the sore, the second being a rash on the skin, whilst the third stage evidences itself when the disease has been neglected, usually within the course of a few months, or even years, when nervous disorders, accompanied by swelling of the glands and other functional ailments, occur. The disease is most deadly from the fact that it may be communicated to others and pass through several generations.

The second disease is gonorrhœa, which although more common than syphilis, is not so disastrous in its effect if properly treated. The disease is conveyed by sexual intercourse, or by infection conveyed to the eyes by using a towel which has been used by an infected person. Serious complications may occur where the disease is neglected.

The third disease is that of a local trouble which can be promptly handled by a competent medical man, and produces no serious results when properly treated.

The prevention of these diseases can best be accomplished by lectures on the risks which are run by illicit intercourse, and by explaining the necessity of immediately reporting to the Medical Officer when infection is discovered, coupled with rigid control of all known loose characters.

The Regimental Officer should pay strict attention to the cleanliness of all quarters of his command. Inspections should be made of all cupboards, corners, ledges, etc., and all possible breeding-places for germs or receptacles for filth. All foodstuff should be kept covered, and all refuse tins should be emptied daily and covers placed over them during the day.

Manure and stable refuse should be removed regularly. Scraps of food and refuse must be deposited in proper receptacles.

The floors of all rooms should be scrubbed twice a week,

and dry-scrubbed daily. Blankets aired daily or as frequently as circumstances permit. Windows of rooms should be left open on the leeward side of the building at night.

The food of the men should be carefully watched to see that it is sufficient and properly cooked. The articles sold in canteens should be regulated to see that they are a wholesome quality. The use of liquor should be discouraged and the evils of excess explained to the men. Frequent lectures upon sanitation should be given by the Medical Officer, making them short and interesting, in order to hold the attention of the men.

Inspections of the men should be held, whereat they parade with bare arms, chests, and legs. This enables the Officer to inspect their skin to see that it is clean and their under-clothing washed.

In the field, facilities should be devised to enable the men to wash their clothing and to bathe. Rest-days when on the march should be regulated, in order to occupy suitable quarters at this time. When marching, the men should be instructed to loosen their clothing at the neck, to avoid smoking on the march, and to rest at halts by removing packs and lying down.

When off parade the men should be encouraged to take part in prearranged sports, concerts, etc., thereby removing temptation to wander into doubtful areas. Interesting lectures may be given to vary the evening attractions.

The moral and physical condition of the men must be the constant care of the Commanders, and the more severe the conditions of service are, the closer must be the personal supervision of the Commanders to insure the maximum of efficiency.

The construction of adequate and proper sanitary conveniences when on the march, in camp, or bivouac, and the

disposal of refuse, etc., needs personal attention, otherwise the men, when tired, will be apt to neglect the necessary precautions.

The success of the whole system of sanitation in the field must depend upon the effective co-operation of every Officer and N.C.O.

CHAPTER XVIII

EVACUATION OF THE SICK AND WOUNDED

Organization of Medical Units—System of Evacuation—Treatment—Invaliding—Red Cross Protection—Voluntary Organization.

THE principle upon which the Medical Service is built up is that the troops must be kept fit for service, but when they become unfit they must be evacuated from the field of operations as rapidly as possible. The presence of a number of sick and wounded proves an encumbrance to a Commander, and since his mobility will be handicapped by being compelled to carry a number of unfit men, every effort is made to remove them to the lines of communication with all despatch. As the supplies required to maintain the unfit must be carried overseas, which makes additional work for the Administrative Services, only those who are unfit to continue their journey to the Home bases are kept on the lines of communication. Where the theatre of operations is situated some distance from England, there may be several areas close to the theatre of operations which will be used for the care of sick and wounded, and they would be removed to those areas to recuperate, the permanently unfit being returned to England.

As the removal of the sick and wounded starts from the firing-line, we shall follow them down the lines of communication, and will start our studies at the firing-line itself.

Every soldier in the field forces carries a first field dressing, which is sewn in the small pocket on the inner side of the

tunic at the left corner of the skirt of the coat. The first field dressing consists of two roller bandages which are each attached to a pad of absorbent material. In packing them, the inner surface of the pad is folded so that the surface is protected from contact with the fingers when opening the package. A safety-pin is lightly stitched to each bandage, and is folded in wax paper to protect it. These two pads and bandages are rendered surgically clean when being cut and folded, and after being sterilized are enclosed in a water-proof outer covering which is sealed hermetically by means of a gummed edge. A small ampoule of iodine is enclosed in a cardboard tube, and is placed between the two sealed packages, the whole being enclosed in a khaki cloth covering, upon which instructions for use are printed. Upon a soldier being wounded, he will use the first field dressing to cover the wound, binding it on by means of the roller bandage attached, or where he cannot manipulate the bandage himself, a comrade will do it for him. This is the first treatment that the soldier gets.

Every regiment in the field maintains a proportion of personnel who are trained and are proficient in first aid to the injured. In a unit as large as an Infantry battalion there is a party of stretcher-bearers, who provide the local transport, by means of stretchers, for the collection of the wounded of the unit. These men are trained in first aid, and after rendering what aid can be given in the field, they concentrate the wounded at a Regimental Dressing Station. Every unit has a Regimental Medical Officer, who is assisted by orderlies. The Medical Officer is provided with a cart to carry his equipment, which consists of a medical and a surgical pannier containing sundry articles by which sufficient treatment can be given to any soldier to allow him to be transported to the nearest medical units. The Medical Officer of the unit will establish a Regimental

Dressing Station, the position of which is published in the operation orders, and, assisted by his orderlies, prepares for the reception of casualties. As the wounded are brought in by the stretcher-bearers, or, where there are no stretcher-bearers, by their comrades, they are given the necessary treatment. Where there is much pain the soldier may be given a sedative to ease the pain, and if necessary his wounds are re-dressed. Broken limbs are adequately protected, and the troops made comfortable until the transport arrives to remove them.

The sick are paraded daily at fixed hours, being collected by the Orderly Corporal of the unit and taken to the M O. for treatment. A sick report is made out, upon which the M.O. records the disposition of the soldier and the nature of his ailment. This report is returned to the Orderly Room of the unit for record.

Every sick or wounded soldier is provided with a tally card, which is affixed to the button of the soldier's coat. On this tally card the number, rank, and name of the soldier, which is copied from the identity disc of an unconscious patient, is recorded, and also the nature of the injury or sickness, any opiate which has been given, and any special precautions as to treatment or carriage which may be necessary. This tally card accompanies the man until he reaches his final destination, being marked by each successive Medical Officer through whose hands the patient passes, so that a complete history of the case is kept, this precaution insuring proper treatment throughout the journey.

The next link in the chain of Medical Services is the Cavalry Field Ambulance for Cavalry forces, and the Field Ambulance for Infantry forces. To thoroughly understand the working of the Field Medical Service it is necessary to master the organization of these units.

The Cavalry Field Ambulances are organized into two

sections. Each section accommodates 25 helpless cases. Cavalry Field Ambulances are allotted in the proportion of four to each Cavalry division.

Field Ambulances are organized into three sections, each of which accommodates 50 patients, making a total of 150 for each Field Ambulance. They are allotted in the proportion of three Field Ambulances to each Infantry division.

Both Cavalry Field Ambulances and Field Ambulances are organized into sections which are complete in themselves, as far as transport, personnel, and equipment are concerned. Each of the sections is organized into two distinct parts, the Transport and the Tent Subdivisions.

The Transport Subdivision is responsible for the collection of the sick and wounded, bringing them into the Tent Subdivisions, which give them required attention and treatment. The transport allotted to these Transport Subdivisions is—

Cavalry Field Ambulances, 4 six-horse (2 per section) and 6 two-horse (3 per section) ambulances, carrying 4 lying-down cases or 12 sitting-up cases, or 2 lying and 4 sitting cases, for the six-horse vehicles, and 2 lying-down or 8 sitting-up cases in the two-horse vehicles; and also 1 G.S. wagon for medical stores.

Field Ambulances have 10 two-horse ambulances, each capable of carrying 4 lying-down cases, 12 sitting-up cases, or 2 lying and 4 sitting cases. They are distributed as follows: Section A, 4; B and C Sections, 3 each. Motor ambulances may be substituted in the same proportion, and having the same accommodation. Two G.S. wagons are allotted to each section for medical stores.

The Tent Subdivisions are the hospitals proper, and carry the surgical and medical equipment and the necessary personnel for their use. The equipment carried is sufficient for a Field Hospital, each section having its own complete

sets. The staff of each section consists of doctors, orderlies, dispensers, storemen, drivers, etc.

A Motor Ambulance Workshop is attached to one of the Field Ambulances in an Infantry division to attend to the vehicles.

The peculiar organization of the Field Ambulances lends itself to the collection of wounded in the field of operations without endangering the efficiency of the Medical Service. During an advance, the number of cases will be very small at first, but, as the advance gets closer to the enemy, the number will increase. In the early stages, it will be sufficient to detach a section to attend to the cases, whilst the others push on toward the troops. Eventually the line will develop a battle of considerable length of time, during which both sides will be fighting for superiority of fire. At this time the troops will be deployed and occupying an extended front. The distribution of the ambulances will then be governed by the roads available, nature of the country, protection available, etc., but usually the sections will be detached to form several dressing stations in convenient spots behind the Regimental stations.

During the initial stages of the advance, the Regimental medical officers will concentrate their wounded at suitable places, where they render temporary aid. The units to which they belong will be advancing, so that unless the M.O. is relieved, the unit will be left without medical service. The Field Ambulance will detach a section which will be sent forward to take over the wounded from the medical officer, and as soon as possible the cases are evacuated back to the railhead. The Regimental officer will establish a chain of successive stations according to the distance covered, and this system of relieving will be continued until the final position of battle is reached. In order to insure effective co-operation between the Regimental dressing stations and

the Field Ambulances, it is necessary that each should keep in touch with the other. After the final position is reached, the Regimental stations will become permanent, and the Field Hospitals established by the Ambulances will be so situated that they can collect the wounded from the various Regimental dressing stations over which they operate, sending them back for evacuation.

In the Cavalry division, the Field Ambulance will look after groups consisting of a Cavalry Brigade, a Troop of Engineers and Signal Service, whilst a proportion of the Horse Artillery will probably be on their front. There is no definite distribution of their units, but this will be the normal position in battle, and consequently the distribution of the ambulances will result in their being responsible for groups of that composition.

In the Infantry division, the groups allotted to the Field Ambulance may consist of an Infantry Brigade, Field Artillery Brigade, Field Company of Engineers, and sundry Divisional Troops.

Each of the units in these formations will establish their own dressing stations, so that the Field Ambulance may have to collect from ten or more different stations. For this reason the location of the Field Ambulances must be regulated by the frontage to be covered, and the distribution of the Regimental dressing stations. In an advance, a section or more of a Field Ambulance may be detached to accompany the Advanced Guard.

The organization of the Field Ambulances is very elastic, and, as has been seen, permits the distribution of the various sections according to the demand, or where only a few casualties are in need of attention, they can be accommodated by a part of the unit, leaving the other part free to follow the troops until required. A section detached will evacuate its wounded, and rejoin the balance of the Field Ambulance at a place previously agreed upon.

In order to secure the co-operation of the Regimental and the Field Ambulance medical services, the senior medical officer of the Division will consult with the " G " branch of the Staff in regard to the possible developments, and will obtain the necessary information to permit the ambulances being detailed to those parts of the field where their services are most likely to be needed, and also to allow time for the officer in charge of each ambulance to locate suitable positions. The " A " branch will be consulted in regard to the evacuation of the wounded, and the co-ordination of the Corps medical transport; or where a division is operating alone, the lines of communication transport, so that the wounded are evacuated from the field of operations. If necessary the " A " branch will arrange with the " Q " branch for the use of supply vehicles for the removal of the wounded. The situation of the Field Ambulances will be included in operation orders in order that the Regimental Officers will know where to communicate their needs as regards the evacuation of their wounded. The success of the operations of both the regimental and medical units depends upon the maintenance of intercommunication, in order that the transport may be used to the best advantage and distributed where the greatest need arises. At the same time, it is important that the positions of the hospitals should be clearly identified, in order that cases capable of walking back to the hospital may be directed properly.

Upon the wounded being received at the Field Hospital, they are given further treatment. Whilst operations can be performed by a Field Ambulance, only very urgent cases should be handled, the operation then being a matter of necessity to enable the patient to be evacuated.

The wounded and sick are evacuated from the Field Ambulances by means of Motor Ambulance Convoys, which are controlled by the Corps Headquarters when the divisions

form part of a corps, or by the I.G.C. when the division is acting independently. The use of the supply vehicles for evacuating wounded may be sanctioned by the Commander-in-Chief, the arrangements being completed by the "Q" branch of the Staff, but ammunition wagons will never be used, since there will be danger of interfering with the fighting efficiency of the troops.

Arrangements for the reception of the wounded from the Field Hospitals are made by the Corps Staff for divisions within a corps, or by the I.G.C. when acting alone. The wounded are brought down to the next unit in the chain—namely, the Casualty Clearing Hospital. This unit is not a mobile unit, but is capable of being moved as required by the use of special transport allotted by the I.G.C. The unit has accommodation for 200 cases, and is intended to receive cases from the field units, distributing them on the lines of communication in accordance with the accommodation available. It forms a regulating station whereby the flow of patients is controlled, relieving the field units of their cases, and only retaining them within its own hands until vacancies for their reception are found on the lines of communication. The allotment of Clearing Hospitals is made in the proportion of one to each division in the field.

The Medical Service in the field operates in three zones. The first zone, known as the "Collecting Zone," is represented by the Regimental Dressing Stations and the Field Ambulances, with the connecting transport between those units and the Clearing Hospitals. If we take the letter "X" as an illustration, we get a rather clear idea of its working. The broad top of the letter represents the firing-line with its chain of Regimental Dressing Stations spread across the front. Farther back we get the Field Ambulances, which establish their hospitals on a lesser front, and which collect from the numerous regimental stations. The

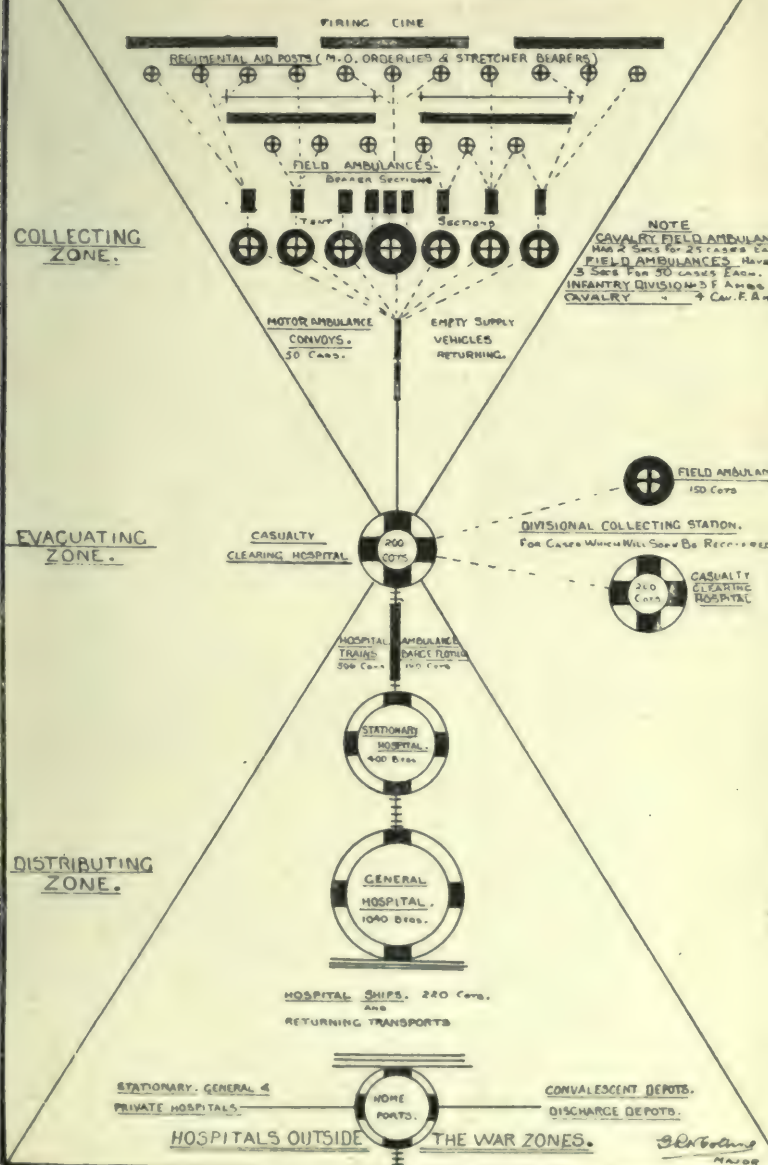
wounded are thereby concentrated into the four Cavalry Field Ambulances in a Cavalry division, or into the three Field Ambulances of the Infantry division, rendering their handling a much easier matter. From the Field Ambulances the cases are either directed to walk or are transported, according to their condition, back to the Casualty Clearing Hospital, which represents the pivot of the letter "X." The cases are then concentrated in one hospital. This hospital represents a separate zone, known as the "Evacuating Zone," and there may be included in this zone the methods of transportation by which the wounded are distributed on the lines of communication. The Clearing Hospital is situated near the railhead, and is in touch with the lines of communication, to which it transfers all cases. The lines of communication represent the third zone, known as the "Distributing Zone," wherein the hospitals of a more permanent character are situated; and since they will be scattered according to the accommodation available and will cover a broad area, the lower part of the letter "X" plainly illustrates the exact situation.

Clearing Hospitals may be established as Rest Stations for the care of cases which are likely to recover in a short while, when they are drawn off to one side from the main communications, receiving their quota of wounded and sick through the Field Ambulances, who may evacuate the severe cases by rail or motor directly to the distributing zone.

From the Clearing Hospitals performing their normal duty in the field, the cases are transferred by either Motor Ambulance Convoy, hospital trains, or barges. The Senior Medical Officer at railhead will be advised as to vacancies on the lines of communication and will distribute cases accordingly.

Hospital trains may be specially constructed, when they are manned and equipped with 396 cots; or they may be

EVACUATION OF WOUNDED.



COLLECTING ZONE.

EVACUATING ZONE.

DISTRIBUTING ZONE.

FIRING LINE

REGIMENTAL AID POSTS (M.O. ORDERLIES & STRETCHER BEARERS)

FIELD AMBULANCES

BEARER SECTIONS

TENT

SECTION

MOTOR AMBULANCE

CONVOYS

50 CARS.

EMPTY SUPPLY

VEHICLES

RETURNING.

NOTE

CAVALRY FIELD AMBULANCE HAS 2 SECS FOR 25 CASES EACH
 FIELD AMBULANCES HAVE 3 SECS FOR 50 CASES EACH.
 INFANTRY DIVISION 3 F AMB.
 CAVALRY " 4 Cav. F. Amb.

FIELD AMBULANCE
 150 Cars

DIVISIONAL COLLECTING STATION.
 For Cases Which Will Soon Be Received.

CASUALTY CLEARING HOSPITAL
 200 Cars

CASUALTY CLEARING HOSPITAL
 200 Beds

HOSPITAL TRAIN
 500 Cars

AMBULANCE TRAIN
 100 Cars

STATIONARY HOSPITAL
 400 Beds

GENERAL HOSPITAL
 1000 Beds

HOSPITAL SHIPS. 200 Cars.
 AND
 RETURNING TRANSPORTS

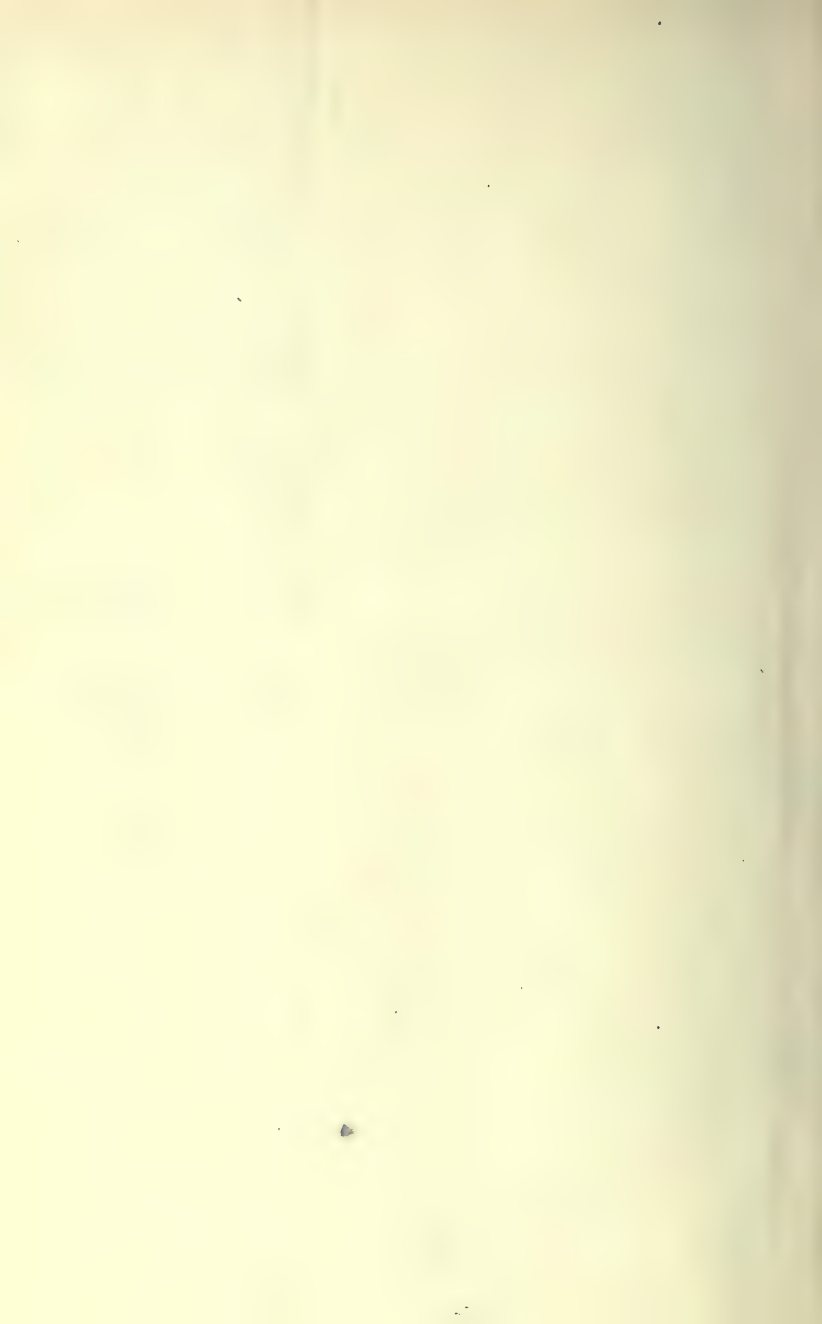
STATIONARY GENERAL &
 PRIVATE HOSPITALS

HOME PORTS

CONVALESCENT DEPOTS.
 DISCHARGE DEPOTS.

HOSPITALS OUTSIDE THE WAR ZONES.

S. B. Boland
 MAJOR



improvised from ordinary trains, by means of portable cot structures, or even by the use of improvised materials, slinging stretchers from the roof and securing them against movement.

Hospital flotillas consist of six barges, accommodating thirty patients each; and since their movement is smooth, and the construction of barges such as to provide roomy wards, they are particularly suitable for the evacuation of sick and wounded.

Arrangements for transportation are made through the I.G.C., the orders for the allotment of transport being conveyed through his local representative to the transport services concerned, the actual medical attention being provided, of course, by the Medical Services, who are responsible for acquainting the I.G.C. of their requirements.

The wounded are taken down the lines of communication and distributed in the hospitals having sufficient room for their reception, these hospitals notifying the I.G.C., through their local Administrative Commandant, as to their available accommodation.

Stationary Hospitals, which are allotted in the proportion of one for each division in the field, are capable of accommodating 400 cases. They are equipped to perform any operation, but are intended to handle cases who are likely to recover and return to duty in a short time. They may be situated at the Advanced Bases, and occasionally, for special purposes, at the Main Base. Hospitals for particular diseases or for the treatment of any special diseases are usually Stationary Hospitals.

General Hospitals are allotted in the proportion of one for each division in the field, and have accommodation for 1,040 cases. They are fully equipped, and closely resemble the military hospitals maintained in time of peace. They can deal with any type of case and retain the patient until

recovery, unless it is decided to evacuate him from the theatre of operations, when he may be sent to special areas allotted for the care of the sick and wounded or to the Home country.

The situation of the Stationary and General Hospitals is usually governed by accommodation available. They require suitable buildings, or camping areas where tents are used, and must have water, healthy locations, etc.

The patients are brought down from the Clearing Hospitals and retained at these hospitals until they are fit for return to duty, transfer to a convalescent depot, or are evacuated from the theatre of operations.

Convalescent depots are organized to handle 1,000 cases, and return the soldier to duty, or, if authorized, send him on sick leave, after which he reports to his unit. They may be situated within the theatre of operations or outside the war zone, and deal with cases transferred to them from the local hospitals.

When a soldier is evacuated from the theatre of operations, he is either sent home on a Hospital Ship which is devoted entirely to the transport of the sick and wounded, and which is protected by the Geneva Convention, or he may travel by a returning transport. Only walking cases would be sent by the latter method. Hospital Ships are equipped to hold 220 lying-down cases, carrying a staff sufficient for that number. Hired vessels of large tonnage may be equipped to carry larger numbers. The system of evacuation has been explained in the lecture on Transportation by Sea, and needs no repetition here.

On arrival overseas the cases are taken to whatever accommodation may be available, which may be in stationary, general, or private hospitals operated by Voluntary Aid or other charitable organizations. Here the soldier receives further treatment, and eventually recovers and

returns to his depot, after being sent to a convalescent depot and granted a sick leave, when he again becomes available for draft, or he may be discharged, if no longer fit for service.

Under the heading of "Records" we shall discuss the system of keeping record of the wounded, since the chain of record will be rendered more complete by that method.

There are a few rules regarding the carrying of the kit of the men, and subsequent renewals of lost or damaged kit, which it may be well to cover.

Ammunition is taken away from the wounded before they leave the firing-line, and is disposed of according to instructions; usually these contain orders to hand same over to the nearest ammunition reserve. The arms, accoutrements, and personal kits of the men accompany them to hospital, and are turned over to Ordnance stores periodically.

As men arrive at the stationary hospitals or general hospitals, as the case may be, their clothing is taken away from them, an inventory made, and the articles deposited in the stores attached to the hospital. The clothing is subjected to disinfectants in order to kill vermin or possible infection, being returned to stores when satisfactory. Clothing, equipment, etc., required to replace damaged or lost articles are drawn from the Ordnance depots, and issued to the troops as required. Every soldier returning to the firing-line must be fully armed, accoutred, and equipped.

Certain technical laboratories are maintained on the lines of communication for research work. Mobile laboratories (Hygiene, Bacteriological) are provided for research work in regard to technical matters. The positions of these units are fixed by the Commander-in-Chief, who issues his orders through the Director of Medical Services. They are usually situated at the base or at advanced depots.

Medical Stores depots are located at the base, and

Advanced Medical Stores at the advanced bases, through which all supplies required by the field medical units are supplied. The transport required to carry the supplies forward is provided by the I.G.C., and by arrangement between the "A" and "Q" branches of the field Staffs.

Voluntary Red Cross Organizations.—By arrangement with the British authorities, voluntary assistance to the Medical Services is given by three Societies:

1. British Red Cross Society.
2. The Ambulance Department of the Order of the Hospital of St. John of Jerusalem, in England.
3. The St. Andrews Ambulance Association.

The first organization is intended for war service, whilst the latter two maintain special departments for use in war. All applications for war services must be forwarded through the first organization, who submit them to the Army Council. During the present war the three organizations have combined for the good of the country's cause, and operate as one organization.

Voluntary organizations are classified under two headings, namely:

1. Those willing to provide suitable gifts for the use of the troops, wounded, sick, etc., and
2. Those willing to provide complete medical units, such as hospitals, rest and refreshment stations, units for road and water transport of the sick and wounded, hospital ships and ambulance trains.

Those of the first class forward all their stores, etc., through the British Red Cross Society, the latter organization stating from whom same were received. These gifts are acknowledged, and are then forwarded to those requiring them.

Persons who are willing to receive patients, whether Officers or soldiers, on their arrival in the Home country,

or those who desire to present complete hospitals for the use of the Military Authorities, forward their application for acceptance through the British Red Cross Society, for transmission to the Army Council. The Army Council reserve the right to refuse any offer in regard to the supply of personnel or hospital units. Under no circumstances will those who are not British subjects be accepted as a part of the personnel of field units.

All voluntary workers must be subject to the Military Regulations, and will be placed under the orders of the Commander-in-Chief. As a rule they will be allotted to lines of communication units, and no voluntary aid may be utilized for field service without the consent of the Commander-in-Chief.

The British Red Cross Society maintains a force of Voluntary Aid Detachments for use in time of war, but each person so enlisting for overseas service must be examined and passed for service as for the Regular forces.

The St. John Ambulance Brigade maintains a force of qualified men and women who are specially trained, who are organized for special war services. These forces consist of—

The Military Home Hospitals Reserve, which provides male orderlies to relieve the regular hospital orderlies of the Royal Army Medical Corps in the Home hospitals;

St. John Voluntary Aid Detachments, who are trained to establish rest stations, temporary hospitals, etc.; and

Royal Navy Auxiliary Sick Berth Reserve, which supplies the Royal Navy with trained sick-berth orderlies.

These units are trained under the supervision of the Army Council, and are recognized as a part of the Medical Reserve.

Use of the Geneva Cross.—The Geneva Cross is reserved exclusively for the use of persons engaged in the collection,

transport, and treatment of sick and wounded, and in the administration of the Medical Services. The badge is worn by personnel on a white armlet, which is worn on the left arm. Every person authorized to wear the red cross brassard must be registered, and the badge issued to them will be stamped with the official stamp of the Medical Services. An identification certificate is issued at the same time, bearing the date and number borne on the brassard, this number corresponding with that shown on the official register of issues.

Red Cross materials, strictly confined to those used for the benefit of the sick and wounded, are marked with the red cross in order to give them protection.

It may be necessary to allot special troops to the use of the Medical Services occasionally, but these are not permitted to use the red cross. Where the number of stretcher-bearers is insufficient for complete collection of the wounded, or when wounded are being loaded into trains or ships, the services of extra troops may be necessary, when they will be allotted by the local command. They are not protected whilst carrying out their duties.

Regimental stretcher-bearers are provided with a special badge marked "S.B.," worn on the left arm. This does not give them protection under the Geneva Convention.

Water Details are not provided with brassards.

Sanitary Police wear an armlet "S.P.," which does not come within the provisions of this Convention.

CHAPTER XIX

REMOUNT AND VETERINARY SERVICES

Provision of Animals—Classification—Registration—Purchase—Subsidization—Mobilization—Reinforcements—Shipment—Care of Sick Animals—Veterinary Hospitals—Convalescent Depots—Captured Animals.

THE Remount Service is responsible for procuring animals for the use of the forces in the field, for breaking and training, and for their concentration and delivery in the field.

A Director of Remounts is appointed to the General Headquarters in the field, and will be located as directed by the Commander-in-Chief. Deputy Directors will be attached to large formations, and Assistant Directors on the lines of communication. The work of the Remount Service on the lines of communication will be supervised by the I.G.C., who will decide the position of all depots, training schools, or other remount establishments, and arrange for the necessary transport for the movement of the animals to the firing-line.

Arrangements for the purchase and registration of animals in time of peace are under the Director of Remounts, who will receive his orders from the Q.M.G., War Office. Animals required for military purposes are obtained in several ways. The system in use in time of peace is as follows:

Purchase horses, which are the property of the Government, and are used in the training of the troops; or are trained after purchase, and boarded out for the use of private persons, who sign an agreement to maintain the horses and to produce them in good condition when required.

Subsidized horses are the property of private owners, who agree to produce the animals for military service when required, and for which they receive a subsidy annually or in bulk.

Classified horses, which are the property of private owners, and are registered as suitable for military service. These animals are taken by impressment under the provisions of the Army Act, upon the declaration of mobilization being sent out. The value of the animal is paid to the owner when the animal is impressed into service.

The Officers of the Remount Service are responsible for obtaining particulars of all animals likely to be suitable for military purposes, and will record the full particulars of the owner, markings of the animal, situation of stabling, etc. Not more than 50 per cent. of the animals in a stable should be taken, nor should any animals belonging to public bodies or food-distributing trades be taken. Horses are paid for at a price fixed by the purchasing Officer, the owner having the right to appeal to the local County Court, who may decide the amount to be paid.

In classifying the animals for military service the following figures are used:

Riders, R. 1	..	..	Fit for Cavalry use, 15-1½ hands and over.
„ R. 2	..	..	Fit for Mounted Infantry, Yeomanry, and pack, 14·2 and 15-1½ hands and over.
Light Draught	..	..	Horses fit for Field Artillery, 15 hands and over, graded as L.D.1. Horses heavier than L.D.1, fit for transport wagons, other than dray horses, 15 hands and over.
Heavy Draught	..	..	Shires, Clydesdales, and similar heavy draught horses, 15 hands and over, that work at a walk.
Pack	..	..	Horses and ponies that work at pack in civil life.

As soon as an emergency arises, a Declaration of Emergency is issued, when the Remount Officers will be given authority by the Remount Commission to proceed to certain areas and impress horses which have been classified. The authority to impress, requisition form, demand, and warrant, are all included in A.F. A.2029. Armed with this authority, the Officer will proceed to any Justice, who will order a constable to accompany the Impressment Officer, and will be present during the impressment. The horses so gathered will be assembled at a collecting station, which has previously been decided upon, from which they are despatched to units in accordance with a list of requirements, also prepared beforehand.

As soon as the order for mobilization has been issued, persons having boarded horses belonging to the Government, and those having subsidized animals, will produce them at the point defined in the form of agreement, where they will be handed over to a military authority.

Whenever horses are purchased or impressed for Government service they should be examined by a veterinary surgeon, and passed by him before acceptance. In case of emergency, it may be necessary for the Impressment Officer to act on his own initiative, but he must exercise care in doing so.

Preparations for the reception and transportation to their respective units of all animals assembled under these conditions are prepared in time of peace.

As soon as the mobilization order reaches the O.C. any unit, he will arrange for the reception of any animals allotted to his command to complete establishments, in accordance with the instructions handed to him with his mobilization regulations. The animals thus obtained furnish him with the extra animals up to war strength.

As soon as the forces have been supplied, the Remount

Service prepares depots for the training and concentration of animals obtained by purchase, as well as the surplus after making issues from the first reserve supply.

The animals are taken overseas under the supervision of the Remount Service, being taken charge of in passage by a conducting party under an Officer. Where a number of subsequent drafts of animals may be expected, Embarkation Remount Depots may be established at the ports, in order to assist the conducting parties in embarking animals.

The animals are taken overseas, and concentrated at the Base Remount Depot or at Advanced Remount Depots. These depots are manned by Remount Squadrons, each of which is capable of handling and training 500 animals. Several squadrons may be assembled at a depot if a larger number of animals are to be handled. As indents for animals are received from the field units, the Remount Squadrons furnish conducting parties to take them up to the units in the field. The transport is allotted by the I.G.C. in the ordinary way.

At the depots it will be necessary to construct kraals for the safe keeping of the animals, and training schools will be established as required.

Advanced Depots receive all captured animals, and may be required to establish depots for the reception of animals who are in need of temporary or prolonged rest. As a rule the latter will be sent to the Base Depot as quickly as possible, only those animals which are fit for issue being retained at the Advanced Depots. Occasionally it may be expedient to establish Field Remount Sections in advance of the Advanced Remount Depots, for the reception of animals, or for supplying immediate needs at the front. Field Sections should evacuate all unfit animals to the Base or Advanced Depots as quickly as possible.

In case of necessity, the Remount Service may be called

upon to assist the Veterinary Service in regard to the care of sick or injured animals.

As soon as an animal is issued to a unit, it will be branded with the Government brand and given an official number, which will be branded on the near forefoot. The number should be in the hundreds. When the numbers reach the thousands, the thousands will be branded on the off forefoot, and the hundreds on the near forefoot. The Government brand should be on the near hind quarter. A letter brand on the off shoulder should be used to denote the nationality of the animal. When branding animals, the brand should be kept sharp, and must be applied when red hot, in order to get a clear sharp brand without sloughing off the skin.

When any shortage of animals occurs in the field, the indent for replacement will be forwarded by the O.C. unit to the headquarters of the formation to which the unit belongs. The Divisional Headquarters will then prepare a consolidated indent for animals required by the formation which will be supplied in bulk from either the Field Remount Section, where there is one, or the Advanced Remount Depot.

Registers of all animals received and issued will be kept at the Remount Depots on A.F. A.2045; this register will show particulars of the animals, by which they can be identified.

All captured animals will be handed over to the nearest unit requiring them (after examination by a Veterinary Officer to see that the animal is free from contagious or infectious disease), the transaction being reported to the nearest Remount Depot. If there happens to be no unit requiring the animal, it will be turned over to the nearest Remount unit.

In either of the last-mentioned cases, the marks of the animal, date of capture and place, should be forwarded to

the Remount Service, when the animal will be passed through their books, and if issued to a unit, will be shown as an issue, even though the animal may have passed direct to the unit.

Animals that are certified to be of no further military value will be shot when in the field, or may be sold off, where the circumstances will permit carrying out such a transaction.

Animals are cast for the following reasons:

For chronic disability.

Unsuitability from any cause.

Worn out.

The disposition of animal will be recorded on A.F. 164, and any moneys obtained by sale forwarded to the Base Paymaster, or are taken on imprest, and entered on the A.F. N.1531a.

As far as practicable, civil personnel will be employed in the care of animals at depots and rest camps, but the actual conducting parties taking the animals into the field will be composed of regularly enlisted and uniformed soldiers.

VETERINARY SERVICE IN THE FIELD.

The Veterinary Service in the Field is under the control of a Director of Veterinary Services, who is assisted by representatives with the various formations and at the various commands on the lines of communication.

The Veterinary Service represents to the animals of the army, what the Medical Service is to the troops. The first duty is to keep animals fit, and when no longer fit, to evacuate them from the field forces as quickly as possible.

The first duty is accomplished by—

- (a) Preventing the introduction of contagious or infectious diseases.

- (b) By prompt treatment in the case of minor ailments, and advice as to the care of animals in the field.

The establishment of the Veterinary Service is made up of the following details:

- Veterinary Officers with the field formations.
- Mobile Veterinary Sections, attached to formations.
- Veterinary Hospitals.
- Veterinary Convalescent Depots.
- Veterinary Supply Depots.

The Veterinary Officers with field units and formations are allotted to Cavalry regiments, Artillery brigades, Infantry brigades, the Divisional Ammunition Column and Divisional Trains, who are assisted by the farriers of the unit or formation. It is their duty to render first aid in all cases of sickness and injury, and to supervise the care of animals. Should they consider that any animal is not properly cared for or that its condition is such as to need treatment, they will call the attention of the Commander to the fact, and take such steps as may be necessary. Where a unit has no Veterinary Officer attached, the representative on the headquarters of the formation will act in case of necessity.

Mobile Veterinary Sections are allotted to each Cavalry brigade and Infantry division, and act under the orders of the representative on the headquarters, subject to such reservations as may be imposed by the Commander of the force. It is their duty to collect all sick or wounded animals within the formation, and to clear them from the fighting zone as quickly as possible. If the force is stationary, they will establish hospitals for the care of animals which are likely to recover soon. Severe cases should be evacuated from the field for treatment.

The Veterinary Hospitals are established on the lines of communication for the care of sick and wounded animals. They are capable of accommodating 1,000 animals. They will be situated at such points on the lines of communication as may be directed by the I.G.C., through the Deputy Director of Veterinary Services, but will usually be at the Advanced Bases or at the Main Base. An Advanced Depot of veterinary stores is usually attached to the hospitals, to supply required equipment and drugs for the field forces. These may be forwarded by the Supply Column from rail.

Veterinary Convalescent Depots are established at suitable points on the lines of communication for the reception of animals discharged from hospital, or tired and worn-out animals sent down for rest. As a rule they will be situated at the bases.

The system of dealing with sick or wounded animals is as follows:

Where the animal is able to walk, it is given the necessary first-aid treatment, and then will be sent down to railhead in the care of a conducting party, and attached to the Divisional Supply Column. This party will consist of one N.C.O. and one man for each truck required on rail, and will be furnished by the Mobile Veterinary Section. Folding water-pails will be carried by the party, and plenty of fodder will be obtained. As soon as the party has started, a wire will be sent to the Veterinary Officer at railhead. The necessary allotment of trucks will be made by the R.T.O. at railhead. Upon delivering up the animals, the N.C.O. will obtain a receipt for the animals on a form supplied to him in duplicate, the original being kept by the Officer taking charge. The conducting party will return with the Divisional Supply Column as far as refilling points, when they return to their section. Each animal will have a label attached to it, upon which will be shown the unit to which the animal belongs

and the nature of the disease or injury. In order to facilitate despatch to proper quarters, the labels used are of different colours according to the disease. These are as follows:

- White .. Medical cases.
- Green .. Surgical cases.
- Red .. Specific cases.
- Blue .. Cast horses, other than veterinary cases.

Where an animal is sent down with a specific disease, the car number must be noted, and all blankets, etc., used for the animal will be sent with it. The animal will be sent to a special hospital.

Where an animal is injured or is too sick to walk, the animal may be destroyed, if certified by the V.O. to be of no further military service, or it may be transported by horse ambulance. This will be governed largely by the nature of the operations. For an advancing force it may be possible to leave the animal at some point, to be collected later and be evacuated to rail. Proper attention must be left for it.

A record of all animals admitted to veterinary hospitals is kept, and is forwarded to the D.V.S. and to the Veterinary Records Office at the Base, on A.F. 2000, made up to Thursday evening in each week. This form shows the number of animals received, classifying the disease in technical terms, and the disposition of those sent away, with balance remaining on charge.

Should a case of infectious disease be detected, it must be notified at once to the nearest Veterinary Officer, who will either direct the animal to be destroyed, certifying the fact and stating reasons, or will order the animal to be isolated. In all cases of infectious or contagious diseases the cause should be investigated, and such steps taken to remove same as is possible. The strictest precautions must be taken to prevent the spread of the disease, and any

orders necessary for this purpose will be submitted to the Staff of the formation, for inclusion in orders.

All captured animals or stock must be examined for signs of contagious or infectious diseases, after which draught animals will be handed over to the Remount Service, accompanied by the V.O. certificate, and all stock to the Supply Service.

As soon as an animal recovers, it will be transferred to a Convalescent Depot, or returned to Remount Services for issue. All animals which are no longer fit for service will be disposed of by the I.G.C.'s orders, or be destroyed.

CHAPTER XX

THE PAY DEPARTMENT

Responsibility for Public Moneys—Payment of Accounts—Purchases—Payment for Requisitions—Field Paymasters—Payment of Troops—Imprest-Holders—Rates of Pay—Allowances—Records of Awards affecting Pay—Remittances—Assignments.

THE Chief Paymaster is responsible for the receipt of all moneys belonging to the army, and for all payments made in the field. He is responsible that all expenditures are authorized, and that proper account is kept of all receipts and payments.

He has control of all personnel connected with the issue of pay, accounts, etc., issuing cash to them and checking their returns. He arranges for the record of all payments made by the different offices, and no special payment may be made without his consent.

His office will be established at the base, and he will have such additional advanced pay offices as the circumstances may demand. He may have a Sub-Cashier at the Central Requisition Office, and if the amount of work warrants, similar officials at the Branch Requisition Offices. In the field he is represented by a Field Cashier with each division, and such additional Field Cashiers with the army or corps troops as the amount of work may warrant.

At the base a Pay Office Clearing House is established, wherein the cash transactions of all sub-accountants in the field are recorded. All accounts of the men in the field will

be kept at the base, and such records as affect the pay of any soldier will be recorded and the accounts adjusted. Information as to these matters will be furnished from Part II. orders by the D.A.G. Base at regular intervals.

Every holder of Government money is entitled to adequate escort, and may appeal to the Officer Commanding the base or formation for the necessary protection.

All moneys received by any department or service, whether obtained from the sale of stores, materials, captured goods, levy, contribution, or any other source, must be reported by the Officer responsible to the Pay Office, and the money handed over to the nearest representative. This money will be credited to army funds and strict accounting made.

All accounts and claims must be supported by an authority for the debt to be contracted and for payment to be made. When stores are requisitioned for the use of the troops in the field, or for concentration at a base, the requisition notes are sent in to the Requisition Bureau in the manner already described. The accounts will be examined and checked as to their accuracy by the Requisition Bureau, when they are passed to the nearest Pay Officer for payment. They must be accompanied by the necessary authority to requisition, in order to establish the right of the person making the requisition to contract the debt. The Paymaster will check the prices with the authorized tariff, and will either direct his local representative to make the payment, or will issue payment from his own office. The stores account to which the charges are to be debited must be shown, and also, where the stores have not been bought on charge in the usual way, they must be accounted for by stating how the goods were used.

Claims for services, unless given under recognized regulations by members of the forces, must be accompanied by a statement showing the authority for the engagement, nature

of the circumstances under which the services were given, copy of the authorized rates of pay, and copy of the local orders showing that the individuals concerned were taken on the strength or engaged, and the date at which such services terminated. Where no existing regulations as to rates of pay can be given, a certificate that the rates of pay are fair and in accordance with the local tariff must be furnished.

Services to the Intelligence Department are certified on a special account, which is furnished by the Officer in Charge of Intelligence Services with a formation, who must make out a certificate stating that he has not received any emolument from the transaction for his own use.

All accounts are rendered in duplicate, duly authorized, and certified as correct by the department or service responsible for the account. The stores account to which the amount is to be charged must be shown, and where the goods have not been purchased on a contract, a certificate that the goods are of good quality and of fair value must be attached.

Claims for accounts that have been paid by individuals must be certified as already described, and receipted invoices attached. In the case of ordinary travelling expenses, where it is not always possible to obtain receipts, a statement of the manner of expenditure must be submitted by the Officer or soldier, but the amounts will be regulated by existing orders in regard to such items as cab fares, portage, etc. On all accounts for these expenses the Officer or soldier must inscribe the words "Certified correct," and sign same in his own handwriting.

Should a claim for some unauthorized expenditure be submitted to a Paymaster, he must present the account to the branch of the Staff concerned with that particular expense account, and obtain the consent of the Commander of the force, through that branch, for payment. Regimental

Paymasters may not pay any accounts of this nature, but will submit them to the nearest Field Cashier, who will refer to the Base Paymaster, if necessary.

Where expenditures of an unreasonable or exorbitant nature are noticed by any Paymaster, it is his duty to call the attention of the Staff of the force to the matter, and he must hold payment until authority is obtained from the Commander. Any correspondence referring to such accounts will be attached to the original account when forwarded to the base.

All Cashiers and Paymasters are responsible for any error or improper expenditure, and are personally liable to the Government for the repayment of the total amount. For this reason it is important that they shall be particularly careful in requiring the observation of the regulations in regard to all payments.

The authorities which are recognized are as follows:

Published rates of pay and allowances, which have been duly approved by the Army Council or other recognized authority.

Duly authorized contracts for stores, supplies, services, transport, etc.

Recommendation for payment by the Senior Officer of a formation or by any Staff Officer who is authorized to issue the authority in his name.

Where any question of doubt as to authority arises, the Paymaster should withhold payment until he has obtained the direction of the Base Paymaster as to action to be taken.

When any irregularity in accounts is discovered, a full report of the circumstances will be forwarded to the Accounting Officer at the base, on to the War Office through the base.

Should any discrepancy be discovered in any account, or a report be received of the loss of any public moneys, a Court of Inquiry must be convened to take evidence and

make report on the matter. This court should be assembled as soon as possible.

The duties of the various Officers charged with the receipt and payment of public funds are as follows:

The Base Paymaster is responsible for the payment and accounting of all pay services within the theatre of operations, and for the receipt, custody, and accounting of all funds within that area. He will make the necessary advances to the other Pay Officers in the field, and record all accounts in connection with same. For every Officer to whom money is issued he will open a ledger account, in which will be recorded all receipts and payments made or accounted for by that Officer. He will cause the accounts of these Officers to be examined from time to time, checking the balances against his own ledgers. He has control over all Field Cashiers and Regimental Paymasters or Imprest-Holders, and issues such instructions regarding the keeping of accounts or other departmental matters as the circumstances warrant.

The Field Cashiers are responsible, through the Base Paymaster, for proper accounts being rendered for all moneys received and expended. They make requisitions for advances to the Base Paymaster, and furnish him with receipts for all expenditures. In their turn they make advances to Imprest-Holders or Paymasters with the units, recording all such transactions, and notifying the Base Paymaster of the advances in their own returns. They will submit all accounts rendered them by *services* and *departments* to the Base Paymaster, first *seeing* that they are properly certified and authorized, and will make payments on the direction of that Officer, when authorized to do so.

Cashiers on the lines of communication or with Requisition Bureaus, perform similar duties to those of the Field Cashiers.

Authority may be given by the Base Paymaster to any

Cashier to make payment of routine expenditures, but usually they will be made by the Base Paymaster direct.

When requisitioning for money, Cashiers in field formations or on the lines of communication will modify their demands in order that surplus amounts, other than working totals of cash, are not held on hand, owing to the difficulty of safeguarding cash in the field.

All requisitions for cash are made on A.F. N.1487, and a daily return showing the amount of all requisitions will be furnished to the Base Paymaster on A.F. O.1817. All receipts and expenditures will be entered in the cash ledger, which will be balanced daily.

All public moneys must be kept separate from any private funds. When they are deposited in a bank, the fact must be notified to the Base Paymaster, together with a copy of the signature of the Officer making deposit, which should be on a facsimile of the one furnished to the bank.

Should an Officer charged with responsibility for any public funds become pecuniarily embarrassed, he must turn over all public moneys in his charge, and will not be eligible for employment as a Cashier or Paymaster until his financial status is restored.

Under no circumstances may public moneys be used for any private or commercial purposes, but they must be strictly confined in their application to military purposes. Regimental funds are not to be held by any Cashier, Paymaster, or Imprest-Holder.

Should an Officer charged with public funds become incapacitated from any cause, the Officer Commanding the formation or unit to which he is attached will take charge of all money and accounts in his possession, and report the circumstances as soon as possible to the Base Paymaster, in order that arrangements may be made to appoint someone in his stead.

PAYMENT OF TROOPS.

The rates of pay for all ranks of the army are fixed by the Royal Warrant. Certain allowances may be granted for different purposes, which are regulated by the Regulations for Allowances.

Rates of pay may be included with allowances for certain appointments, when they are called "consolidated rates of pay." These rates are graded in accordance with a definite, scale.

The appointment of any Officer is published in the *London Gazette*, which gives the necessary authority for him to be included in the Army Pay Roll. Subsequent promotions or appointments are promulgated in the *London Gazette*, but authority for payment may be given by any person having the necessary authority to make such appointment or promotion, but the change in pay must be published in the orders issued by that authority.

In the case of rank and file, their enlistment appears in the orders of their unit, and any subsequent promotion is made by any Officer having power to grant the rank or appointment, the authority for the Pay Department being furnished by the orders of the Officer Commanding, or, where that authority is necessary, the General Officer Commanding a formation.

Any change in the rate of pay of an Officer or soldier must be published in orders by competent authority before any payment can be made at the new rate. In order that the Pay Department may be advised of all changes, the D.A.G. Base will furnish the Base Paymaster with copies of all Part II. orders of the units and routine orders of formations, whilst Paymasters with the units in the field are responsible for making the necessary entries in the

pay-book of the soldier at the time of the promulgation of the order.

Upon a soldier being enlisted, he is paid the rate of his rank, as laid down in the Royal Pay Warrant. The rates of his subsequent advances, etc., are fixed by the same authority.

An Officer is given certain allowances if called up from the Reserve or from the retired or half-pay list for active service. These allowances are as follows:

Outfit Allowance.—A sum not exceeding £100, with which he is required to purchase the complete kit which he needs for active service.

This allowance is also given to a Warrant Officer or N.C.O. who is given a Commission, the limit being extended to £150 in their cases. Claims are made on A.F. O.1670-1.

Camp Kit Allowances may be given to Officers on first appointment, or to nurses of the Military Nursing Service, for which receipted bills must be produced. This amount is limited to £5 15s. Claims are made on A.F. O.1678.

Travelling and Lodging Expenses incurred whilst travelling on an authorized duty may be paid, the claims being submitted on A.F. O.1771.

Field Allowance is paid to every Officer and soldier whilst on active service, with the exception of those who are on consolidated rates of pay. This allowance is intended to cover expenses caused by the absence of proper barrack accommodation. Officers and Warrant Officers proceeding on active service may draw not more than 91 days in advance. Claims are furnished on A.F. O.1628.

An Officer may claim indemnification for loss of any equipment which is authorized as part of his field kit, and which has been lost or destroyed as a result of circumstances beyond his control, provided it was in pursuance of his military duties. Claims are submitted on A.F. O.1784-7.

Prior to the declaration of war, certain documents are prepared for every soldier serving with the Colours, and for every Reservist on the strength of the unit. These documents are held by the Officer in Charge of Records in the unit, and as soon as mobilization commences they are filled in with the necessary particulars. The forms carried for each soldier are as follows:

Paybook, A.F. 64.

Statement for separation allowance or certifying that the soldier is unmarried, A.F. D.418.

Certificate of identity for wife and children, A.F. D.442.

Allotment of pay, A.F. O.1796.

Transfer statement of account, A.F. O.1812.

As soon as the soldier reports to his unit for mobilization, the Officer in Charge of Records will cause the soldier to fill in these forms.

Separation Allowance is claimed for dependents, by every soldier on the married roll of the regular establishment, and for Reservists rejoining the Colours. The rate is fixed by Allowance Regulations, according to rank. The soldier will fill in A.F. D.418, and furnish the required certificate of identity of wife or dependent upon A.F. D.442. This allowance is paid direct to the dependent, and cannot be drawn by the soldier himself.

Assignments of pay made by the soldier are deducted from his pay, and paid to the beneficiary named by him on A.F. O.1796.

As soon as these forms have been filled in and submitted by the soldier, the Officer in Charge of Records will fill in the particulars in the Active Service Paybook of the soldier, A.B. 64.

The Active Service Paybook of the soldier is carried by

him throughout his active service. It contains on the first page instructions in regard to presenting for payments, and on the second page particulars of the soldier, covering his full name, rank, unit, company, squadron, etc., date of attestation, and religion, with any particulars of service which may require note. The next page covers his daily rate of pay and field allowance, these two being totalled together and again shown in the monthly rate of pay. Any stop-pages for assigned pay are then deducted, and the net total payable to the soldier per month is totalled at the bottom. The soldier will sign this page with his normal signature, testifying to the accuracy of the figures, the signature being witnessed by the Officer in Charge of Records, or Paymaster making out the book. The next page has blank certificates wherein any alteration in the rate of pay of the soldier is noted, and signed by the person making the entry. The following page contains particulars of his family. The next of kin, their address, the number of children, if any, is recorded. The opposite page has a column in which any deductions or additions to pay are recorded. There follows next several pages on which all cash payments are entered, showing the place, date, amount, and the signature of the Officer making payment. At the top of the first of these pages, there is a line whereon the signature of the soldier is shown. This is followed by the net balance to the credit of the soldier, the signature of the soldier being attested by the Paymaster making the entry. In the last pages of the book are instructions as to making a will, with a specimen form of will. The soldier is invited to make out his will, which is then detached by the Officer, and forwarded to the Records Officer for safe-keeping. A note as to the disposition of any will is entered in the book, on a page allotted for that purpose. The last page will contain entries showing when the soldier was vaccinated and inoculated, whilst the

lower part is reserved for an entry as to the equipment on charge to the soldier.

As soon as the paybook has been entered up, a transfer certificate of account is made out, and forwarded with the other regimental papers of the soldier to the Base Pay Office through the D.A.G. Base. Record papers go to the Record Officer, whilst pay documents go to the Pay Department.

As soon as the accounts of the soldier are received by the Base Paymaster, an account is opened, and the amount of credit or debit shown on the transfer certificate entered in the ledger. The accounts of the soldier on arrival in the theatre of operations are complete to the date of his arrival.

Method of making Payment to the Troops in the Field.—In most units in the field certain Officers are appointed as Imprest-Holders—that is, holders of public money authorized to make payments to the troops. These Officers are usually the Squadron, Company, Battery, or Section Commanders in the different units.

An Imprest-Holder is authorized to make payments of the following accounts:

1. Cash issues to soldiers on Acquittance Rolls.
2. Officers' emoluments and soldiers' local or temporary emoluments, but only under the specified instructions of the Paymaster concerned.
3. All other services which cannot be possibly effected by means of payments by a Cashier.

Every Imprest-Holder is responsible for the proper payment of all moneys entrusted to him, and is personally responsible for any deficiencies. No Officer may decline to act as an Imprest-Holder, nor may he decline to make payments which cannot be ordinarily paid by a Field Cashier.

Where it is considered expedient to appoint any person as an Imprest-Holder who would not ordinarily be granted

the control of public moneys, it is necessary to obtain the consent of the G.O.C. the force with which he is employed, and if in any special circumstances it should be necessary to grant the imprest without first obtaining the permission, steps must be taken to procure same at the earliest possible moment. A Field Cashier must notify the Base Paymaster of the circumstances and obtain his direction wherever possible.

It will sometimes be necessary to issue an imprest to an Officer detailed to make requisitions, for which the authority has already been given by a G.O.C.

Imprest-Holders must be particularly careful to keep all moneys in a safe place, and, owing to the difficulties which will confront Officers in the field, they should not carry more than is required for immediate purposes. They must keep careful record of all moneys received and expended, stating the items in clear but brief terms, and quoting the authority. Should an Imprest-Holder have a balance of cash in hand on arriving in the theatre of operations, he will show the balance on his first return which he forwards to the Base Paymaster.

He must procure a receipt for every payment he makes, but should it occur that he has to make a payment under any circumstances which make it impossible for a receipt to be obtained, he will send a certificate to the effect, giving a brief statement of the particulars.

Imprest-Holders make requisitions for funds upon the Field Cashier on A.F. N.1487, giving a receipt for same. He will at once enter the amount on A.F. N.1531a.

A.F. N.1531a, Account Form, is made out in duplicate, using a carbon sheet. It is divided into two parts, debit and credit. On the debit side the Imprest-Holder will enter the date, number of the voucher, and person from whom received, with the amount. All vouchers for cash

received should be numbered consecutively throughout the period of service. This form is retained until the end of the month, when it is forwarded to the D.A.G. Base, who will transmit it to the Base Paymaster.

Payments made to any soldier or person must be supported by receipts. Invoices, properly receipted for any authorized payment, will be sent as already described.

When payments are made to troops, the Imprest-Holder will demand the paybook of the soldier. He should then take the following precautions:

1. First examine the name, number, and rank of the soldier, and ascertain whether the soldier is the proper owner of the book. This is unnecessary where the man is known.

2. Examine the page allotted to rates of pay, and see what is the total net amount due to the soldier per month.

3. Examine the casualty page, and ascertain whether all deductions for punishments, etc., have been made in the cash page, deducting any that have not been recorded.

4. Total the amounts received by the soldier since the book was issued, counting the balance to credit or deducting the amount of debit shown at the top of the page, and compare with the total amount remaining to the credit of the soldier at time of making of request.

Upon being satisfied with the result of this examination, the Officer will make out an Acquittance Roll in duplicate, A.F. N.1513. This form is issued in pads with folding cover. At the top there is a space for a number. The numbers used should run consecutively throughout the period of service in the field. A letter and serial number is best. The company, etc., is next entered, and the unit, with the place of making payment. In the main column the regimental number, rank and name, amount of payment, which must be entered in the currency in which payment is made, and

then the soldier is requested to sign the pay-roll. When the soldier has signed the Acquittance Roll, the following routine should be adopted:

1. Compare the signature with signature in paybook when the soldier is not known to you.
2. Enter the amount of payment, date, and place in the cash pages of the soldier's paybook, and sign with your signature and rank, and where the soldier does not belong to your own unit, append your own position as Imprest-Holder.

As soon as a sheet of the Acquittance Roll has been completed—and it is better to state definite times for making payments, using a sheet for each platoon, troop, or other unit—fill in the total amounts of payments at the bottom, written in full, and sign the sheet. If another Officer has been detailed by the Imprest-Holder to make the payments, he must obtain the signature of the Officer actually making the payment, and attest his signature with his own.

Upon completion of the sheet, the serial number, total amount of payment, and date, with particulars of payment, such as "Payments to Troops," should be entered on the Account Form, A.F. N.1531a.

When the payments of the day have been completed, the Imprest-Holder will forward the original copies of the Acquittance Rolls to the D.A.G. Base for transmission to the Base Paymaster.

Upon receipt of these Rolls, the amount of payments is credited to the Imprest-Holder in the ledger, and the amount of payments debited against the soldier receiving same.

On the last day of each month the Account Form, A.F. N.1531a, is balanced up, the total balance in hand or due to the Imprest-Holder being shown at the bottom, and the form will then be signed by the Imprest-Holder and for-

warded to the D.A.G. Base. Any balance should be carried forward on to the next form which is to be used.

The accounts as shown by this form are compared with the vouchers submitted by the Field Cashier and the payments as shown by the Acquittance Rolls, thereby establishing a check against the Field Cashiers and the Imprest-Holders.

In order to insure the correct keeping of the accounts of the soldier, every casualty which affects a soldier's pay must be promulgated in orders. As soon as any casualty is notified, the Officer Commanding will demand the paybook of the soldier concerned, and will make the necessary entry. If a deduction is to be made, the gross amount will be deducted by recording the facts on the cash page, and an entry made in the casualty column.

In the same way, should a soldier deliver any money to the Paymaster or Imprest-Holder, the amount will be entered on the cash page, showing the amount of deposit, and the Imprest-Holder will record the receipt on his own A.F. N.1531a.

Should a soldier desire to make a voluntary allotment of money, he will make application on A.F. O.1796, which will be forwarded to the D.A.G. Base after the Imprest-Holder or Officer receiving the allotment form has entered the amount of the allotment in the soldier's paybook, and has recorded the fact that it has been entered on the form.

When a soldier desires to make a remittance of money to any person, he will make an application on A.F. O.1727, when the same procedure will be followed, the entry being made in the paybook and the fact noted on the form.

In both of these cases the amount designated by the soldier will be paid to the person to whom he has made the remittance or monthly allotment.

Should a soldier lose his paybook, his Commanding Officer

may order that a new book be issued to him. When this is done, however, the account of the soldier in the field will be opened as from the date upon which the new book was issued, and no payment previous to that date can be allowed. The book will be made up from particulars available from regimental records as to the rates of pay, etc., but the person making out the book will be responsible for the accuracy of the book and all subsequent entries made on the original entry. Should the old book be recovered, it must not be taken into use again, but will be plainly marked "Cancelled," and returned to the Base Paymaster. Any amount accruing to the credit of the soldier from the old paybook will be adjusted in his accounts on completion of his service.

When a soldier dies before the conclusion of his service, his paybook is forwarded to the Base Paymaster through the D.A.G. Base, who will abstract any will and attach same to the certificate of death, A.F. B.2090a, when the book is passed to the Pay Department, in order that the deceased soldier's account may be closed and adjusted with his next of kin, or in accordance with the directions contained in his will.

Upon completion of the service of a soldier, his book is taken by the Pay Department, any will abstracted, and returned to the soldier. The accounts are then compared with the entries in the book, and eventually his accounts adjusted. If a unit is ordered to be disbanded, the paybooks of the men will be collected at least fourteen days prior to the date of disbandment, and sent in as has been described. No further cash payments should be made to a soldier after his paybook has been forwarded for closing of account. Should the man incur any stoppage for any reason during these fourteen days, it must be notified to the Paymaster in order that the amount may be deducted.

The importance of every Imprest-Holder strictly observ-

ing these rules cannot be too strongly impressed, since any deficiency must be made good by him. Every receipt of money must be recorded on his A.F. N.1531a, as well as all payments, since the cross-checking system in use will enable the Base Pay Office to detect any omissions in receipts, owing to the person paying them over being held responsible for strict accounting of their own payments, any error will be recorded, and eventually presented for correction. In the field it is very important that the Officer making payments, often under conditions which are unfavourable, should accustom himself to the routine method of making payments, and should avoid any carelessness whilst doing so.

The D.A.G. Base will pass copies of Part II. orders and Routine Orders to the Base Paymaster, and all extracts affecting the pay of any soldier will be at once entered on the man's accounts.

The pay and allowances of Officers are deposited in a bank, against which the Officer may draw, the responsibility that all demands can be met resting with him. An Imprest-Holder may cash cheques of Officers, forwarding the cheques to the Base Paymaster as vouchers of payment, for collection.

Imprest-Holders attached to medical units may make payments to soldiers who are inmates of the hospital, subject to any regulations in regard to issues of pay to patients that may exist.

The amount of pay to be paid to soldiers in the field may be limited by the Commander-in-Chief, the balance remaining to the credit of the soldier until the completion of the campaign. Irregular payments to the troops should be avoided, but fixed days for payment should be made. These will usually be twice per month.

CHAPTER XXI

STATES, RECORDS, AND RETURNS

Records on Mobilization—Records of Embarkation—Base Records—
Field Records—Collective States and Returns—Individual Records—
Despatches—Reports on Action—War Diaries—Historical
Records.

THE keeping of records of every man and animal in the field is a task which is handicapped by many difficulties, and yet is a matter which demands the greatest care and accuracy. The collection of data for record purposes may be roughly classified under three main headings. They are as follows:

1. Records of the individual, whereby his pay, service, and all changes in his status are recorded.
2. Records of the units and formations, required for all collective statements, which record the actual fighting and ration strength of the units or formations.
3. Records of history, which are compiled from various sources, and upon which the history of the regiment, and also of the campaign, are later based.

In order to enable the responsible authorities to compile the required statistics in regard to either of these classes, it is necessary that the information shall be furnished by the unit or formation, and in order to insure systematic record of all important matters, certain rules and regulations are necessary. These rules are uniform throughout the Service, and definite forms are used in preparing the different reports.

We shall take the first class—namely, the records of the

individual and show how he is taken on the strength of the field force, and how his record in the field is kept account of.

When a soldier is mobilized for active service, the forms already discussed in the lecture on Pay and Accounts are prepared by the Officer in Charge of Records. In addition, there are certain other forms which must be prepared and filled in. They are—

1. Identity Discs, bearing the name, number, rank, unit, and religion of the soldier, and worn around his neck throughout the period of his service. The discs issued are red and green respectively, the one being suspended from the other.

2. Casualty Form, A.F. B.103, the heading of which shows the rank, name, number, unit, religion, age on enlistment, period of service, date of promotions, special qualifications, which are filled in and signed by the Officer in Charge of Records. A space is reserved for date of embarkation and disembarkation, and in the columns the following particulars are recorded as they occur:

- Column 1. Date of report, and from whom received.
- „ 2. Record of any casualty, promotion, reduction, transfer, etc., as shown on official records.
- „ 3. Place of such casualty.
- „ 4. Date of the casualty.
- „ 5. Any remarks copied from official returns.

The method of making entries will be discussed later.

3. Field Conduct Sheet, A.F. 122. The heading of this form records the regimental particulars of the soldier as above. The spaces on the second line include date of last entry on Company Conduct Sheet, number and date of last drunk, period not reckoning toward exemption from penalties for drunkenness, Sheet No., signature of the O.C. Company, and an assessment of the character of the soldier couched in

military terms, as laid down for a certificate of discharge. The columns below show the following particulars:

- (1) Place of subsequent offences.
- (2) Date of ditto.
- (3) Rank at time of committing offence.
- (4) Cases of drunkenness, the number entered in red ink.
- (5) Offences charged.
- (6) Names of witnesses.
- (7) Punishment awarded.
- (8) Date of award or order dispensing with trial.
- (9) By whom awarded.
- (10) Remarks.

This Form is filled as far as the headings, and signed, any subsequent entry being made in the way we shall describe.

These papers constitute the personal records of the soldier during his period of field service, supported by any entry made in his paybook.

The Identity Disc is carried by the soldier, and with his paybook provide a means of identification.

The Field Conduct Sheet is carried by the Officer Commanding his unit, or the O.C. Company, Squadron, Section, Battery, etc., by whom all subsequent entries are made.

The Casualty Sheet is forwarded to the Base Record Office.

Certain documents retained in time of peace for each soldier are forwarded to the Officer in Charge of Records at the Regimental Depot of the soldier. These papers include the following:

Duplicate Attestation Paper.

Regimental Conduct Sheet, A.F. B.120.

Company Conduct Sheet, A.F. B.121.

Medical History Sheet, A.F. B.179.

Will abstracted from paybook, A.F. 64.

As soon as the unit proceeds overseas, the O.C. unit or in case of Drafts, the Officer in Charge of Base Details, will cause a Nominal Roll showing the rank, number, name, and unit of every Officer and soldier and the Casualty Sheet A.F. B.103, to be sent to the Base Record Office.

The Officer in Charge of the force, when embarking, will furnish the number of Officers and other ranks, etc., on an Embarkation State. A similar State will be rendered when disembarking, accompanied by a Nominal Roll of all ranks. These two documents will be presented to the Military Landing Officer, who will check the numbers of the State against the Nominal Roll, passing them through the Base Commandant to the Base Record Office. The names are then checked against the Nominal Roll which was forwarded with the Casualty Forms, the latter being checked to see that a form was provided for every individual.

The troops are taken on the strength of the Base Depot, and borne upon the strength of that unit until they are taken to the front. We shall explain the method of checking the totals of all forces, and the methods of accounting for the individuals with regard to the system applicable to all formations and units, irrespective of where they are situated. Whenever a soldier is given promotion, reduction, punishment, etc., which affects his pay, the particulars are entered in Part II. of the Regimental Orders, or, where the authority of a General Officer is required, in the Routine Orders of the formation, when the O.C. in Charge of the unit or part of unit to which the man is attached will see that a corresponding entry is made on the Field Conduct Sheet of the soldier, and also in his active service paybook. The system whereby these entries are checked and any casualty affecting the service of the man is recorded and entered will be explained in the description of Collective States and Returns.

It is sufficient to call attention to the fact that the

documents referred to, and carried with the moving forces in the field, must be an exact copy of those retained at the Base—namely, the man's pay account and his Casualty Form A.F. B.103. The system of making these records will be explained.

The collective records of the units or formations in the field are made in two ways—*i.e.*, by States or Returns.

States are furnished daily, or as often as may be necessary, and will show the fighting and ration strength of the unit. The figures will show Officers and other ranks, animals, vehicles, rations, and ammunition in hand. Emergency States may be rendered after a battle, referring to the existing fighting strength of the force. Whilst accuracy should be maintained as a matter of principle, speed more than accuracy will often be necessary in regard to emergent States. The Daily States should be correct.

Returns are furnished periodically, but greater care must be shown in their preparation. A Return deals in detail with the particulars of the subject, giving names, ranks, numbers, etc. The Returns are the definite forms upon which the individual records are made up.

When a unit embarks for overseas, the State that has already been mentioned is delivered to the Officer in Charge of Embarkation, or the Military Landing Officer when disembarking, together with a Nominal Roll. Should anything happen to the sea transport, therefore, the particulars of all on board are available. In the same way, the roll will show the actual number landing in the theatre of operations, and when checked against the Nominal Roll and the figures found correct, it affords proof of the arrival of each individual. From that date forward every move of the individual must be accounted for in some return. The totals as shown in the States furnished in the field, must tally with the totals held at the base. Should there be a discrepancy of one

individual, the numbers will not tally, and immediate inquiry must be made to ascertain who the missing individual is, and where he has been lost.

A Field State is furnished every day by every Officer Commanding a unit on A.F. B.231. This State gives the totals in figures only. It is forwarded through the various formations, and eventually reaches the D.A.G. Base. Each successive formation prepares a similar State, but compiles its figures by giving the totals copied from each unit, and adding its own Headquarters Staff and Sub-staff. From this State the total strength of any unit, formation, or of any lines of communication command, can be readily ascertained. Field State, A.F. B.231, bears a heading showing the unit or formation to which the State applies. The different columns are as follows:

1. Unit, used by formations to show units included.
2. Personnel, Officers.
3. Personnel, other ranks.
4. Horses or mules, riding.
5. „ „ draught and pack.
6. Other animals.
7. Ditto.
8. Guns and ammunition wagons, stating nature of same.
9. Machine-guns.
10. Ambulances.
11. Tool-carts or technical vehicles, stating nature,
12. Remarks.

The whole of these columns are applicable to the "fighting strength," and does *not* include details attached to unit, personnel attached to the baggage train, or any men unfit to go into action.

The following columns apply to every man and animal

actually with the unit or marching with the train, for which rations and forage are required.

13. Personnel, total entitled to rations.
14. Horses and mules, heavy horses.
15. Other horses and mules.
16. Other animals.
17. Ditto.
18. Motor-cars.
19. Motor-bicycles.
20. 3-ton lorries.
21. 30-cwt. lorries.
22. Tractors.
23. Remarks.

At the bottom left-hand corner a form is appended as follows:

AMMUNITION WITH UNIT.

.303-inch: number of rounds per man (approx.)
 .303-inch: number of rounds per machine-gun (approx.)....
 Gun or howitzer: approximate number of rounds per gun or
 howitzer

At the bottom right-hand corner there is another form as follows:

Approximate number of days' rations for men of ration
 strength

Approximate number of days' rations for animals

Approximate number of days' fuel and lubricants for mechan-
 ically propelled vehicles

The Commander of the unit or formation will sign the certificate at the bottom.

From this form, it will be seen, a Commander may tell at a glance what his actual fighting strength is. The Supply

Service can also tell the exact amount of rations to be issued to each unit or formation for the following day. It therefore provides a compact statement which furnishes any Commander with definite information regarding any portion or the whole of his force.

A Casualty State may be prepared by a Commander immediately after an action, whereon the number of casualties in other ranks will be shown in figures, as killed, wounded, and missing. The names and nature of all casualties of Officers will be written in full on this State. As has been explained before, where the list is very heavy and the force is endangered by the weakness of any unit or formation, it is the duty of the Commander to call the attention of his superiors to the danger by special message. A Casualty State does not provide a means of record, but is a preliminary report in order to allow the Commander to adjust his fighting strength to the requirements, and also to enable the I.G.C. to prepare for the forwarding of the necessary reinforcements.

In regard to the preparation of more detailed records, it is necessary that the actual particulars be furnished, and in this case a return is necessary. Several forms of return are used, and we will take them in turn.

Minor Offence Report, Field Service, A.F. B.2069.—This form is used to record any punishment given by a Commanding Officer, and is furnished weekly, on Sunday. The entries made on this form are recorded in the Conduct Sheets of the individual and, where applicable, in his pay-book.

Field Return, A.F. B.213.—This form is furnished weekly on Sunday, entered to midnight Saturday, by the Commander of all units and formations, and is forwarded direct to the D.A.G. Base by letter service. This form is the actual basis of the entries made on the individual records of the

soldier. The form consists of four pages, printed on two sheets, one sheet being detachable by means of a perforated line.

The first page is divided into columns lengthwise, showing particulars of the following personnel, animals, etc.:

Personnel.—Officers, other ranks, natives.

Animals.—Riding, draught, pack, horses, and large and small mules, camels, oxen.

Vehicles.—Gun-carriages and limbers, ammunition wagons and limbers, machine-guns, aircraft, 4-wheel and 2-wheel horsed vehicles, motor-cars, lorries, trucks, bicycles, tractors, trailers, and motor-cycles, and a remarks column.

The page is ruled lengthwise, the total being shown as under:

Effective strength of units
Details, by arms, attached to unit as in War Establishment.....

Total.—

War Establishment
Wanting to complete
Surplus
Attached (not to include the details shown above)
Civilians
Employed with unit
Accompanying the unit
Total rationed

Signature of Commander.

Date of Despatch.

From this page it will be seen that the detailed totals of the columns enumerated can be obtained at a glance.

The first total shows the actual effectives; the second, attachments which are authorized in War Establishments and the total actual strength. The number authorized in War Establishments is followed by the totals additional or short of each class of personnel, animal, or vehicle. The second column for "attached" is used to show any details attached who are *not* authorized by War Establishments. Provision is made in that total for any extra units attached to the original unit for duty, and, in the case of medical units, is where patients in their charge are entered. The Return then concludes with civilians attached, and the total actual strength. It will be noticed that this Return is a statement in figures, but it is supported by actual words on the other page.

On the reverse side of this page (page 2) space is provided for Officers and men who have become casualties, been transferred, or joined since last report. The columns provided are as follows:

1. Regimental number.
2. Rank.
3. Name.
4. Corps.
5. Nature of casualty, or name of unit to which transferred or received from.
6. Date of being struck off or being taken on strength.
7. Remarks.

On this page every entry affecting the record of a soldier must be entered.

Casualties are shown as killed, wounded, or missing, as far as is known; those not positively accounted for should be shown as missing, any remarks justifying the report being shown in the remarks column.

Reinforcements.—The Nominal Roll of Officers and men who are received from any source whatever are shown, giving the date of taking on strength.

Deductions from the Strength, whether they be as a result of casualty, punishment, transfer, temporary detachment for duty, or for any other cause, must be shown, but the statement in the remarks column should give an idea of the probable length of absence.

Any matter of record which affects the pay or service of a soldier, such as punishments, awards, recommendations, fines, etc., must be recorded, in order that Part II. orders may be compiled at the base.

Any information which may be of service to friends of casualties should also be entered opposite the name in the remarks column.

From this page the Casualty Sheet at the base is made up, and the greatest care as to accuracy must be observed on this account.

The second sheet (page 3) is intended for the information of the Reinforcements Department, and is ruled in a number of columns showing the different classes of personnel that may be required for any arm. It classifies the different ranks by trades and special technical qualifications, and includes columns for animals, describing the class of animal required. From this sheet the reinforcements are prepared according to requirements, and directed to the unit or formation for which they are needed.

Page 4 is blank, and intended for any supplementary remarks regarding the reinforcements demanded.

A Nominal Roll of Officers, A.F. B.158, is prepared monthly and sent to the D.A.G. Base for transmission to the Officer in Charge of Records of the unit.

Officers in charge of medical units make out similar documents to those described, but in addition they make

certain returns in regard to the sick and wounded under their control.

As soon as a soldier is admitted to any hospital, his name is entered in an Admission and Discharge Book, A.B. 27, which shows the full regimental particulars of the soldier, nature of casualty, date of admission, date of transfer, death, or return to unit. Each case is numbered consecutively. From this book the daily return of cases is made up. These returns show the number of cases in the hospital, specifying full particulars, and also recording those who have been taken from the hospital. The forms used vary with the unit, but similar returns are made by all Hospital Units, whether they be mobile units or stationary ones. They are made up to midnight of each day.

Every week, terminating at midnight on Saturday, the O.C. a medical unit will prepare a return of admissions and discharges on A.F. A.36. This Form will record the regimental particulars of a soldier, nature of casualty, date of admission, date of transfer, death, return to duty, etc., and remarks as to his condition.

When wounded are invalided from the theatre of operations, the Medical Officer in Charge of Embarkation will furnish the Military Landing Officer with a Nominal Roll of wounded as well as an Embarkation State. This Nominal Roll will be forwarded to the D.A.G. Base for record.

When any Officer or soldier is reported missing, and his absence has not been satisfactorily explained at the end of six months, a Court of Inquiry will be convened, and all available evidence obtained, after which the Court will decide whether the Officer or soldier may be presumed to be dead. The proceedings are forwarded to the D.A.G. Base.

We will now turn our attention to the office of the D.A.G. Base, and follow the system by which the records are corrected.

Upon the receipt of the Field States, the numbers carried on the Nominal Roll at the base are checked and the figures noted, and on arrival of the Field Return they are closely checked, and if the error has not been discovered from that document, the attention of the unit is called to the discrepancy.

The D.A.G. Base will cause a Consolidated State to be made on the front of A.F. B.231, showing the distribution of the troops—

- (a) On the lines of communication.
- (b) With the field forces.

This State will be prepared on the receipt of A.F. 231, and will be distributed in accordance with instructions issued by the Commander-in-Chief. Naturally, this document will be a confidential one, and will only be intrusted to the Higher Commands.

A similar Return will be made up each month and issued, in which the difference between the previous month will be noted.

From the information contained in the different documents that have been described, the D.A.G. Base will compile the Part II. orders of every unit, furnishing a copy to the Officer in Charge of Records, the Base Paymaster, and the unit concerned. This copy of Part II. orders (A.F. O.1810) furnishes the required authority to strike a man off the strength, alter his records, etc., and to adjust his pay. The particulars carried in these orders will be entered in the pay-book, and, if applicable, the Field Conduct Sheet of the soldier, and also on his A.F. 103 at the base. The records in the field and at the base should therefore be a counterpart of each other.

If a soldier is wounded, his name may appear as "missing" in the A.F. B.213 of his unit. Information sent in on A.F.

A.36 by a medical unit may show the man to be an inmate of a hospital, when the corrected return would be transmitted to the field unit in the Part II. orders, A.F. O.1810.

As soon as the returns of the medical units have been received and verified, the D.A.G. Base will prepare a casualty list showing the number, rank, and name of all casualties, and will forward the same to the War Office in the case of troops enlisted in Great Britain or the Colonies, or will publish the same in the case of troops enlisted in the theatre of operations.

If a soldier has been killed, his name will appear in the Part II. orders as soon as verification has been received. If definite information of the death of a soldier and his identity disc and personal effects have been returned to the base by his unit or, if he dies in hospital, by the medical authorities; or where he has previously been reported as "missing" and a Court of Inquiry has subsequently declared him as "killed," the D.A.G. Base will make out a death certificate on A.F. 2090a, and will attach a will (where one has been found in the paybook), and will send same to the War Office, notifying the soldier as "killed" in orders, upon which he will be struck off the strength of the unit, and his accounts will be forwarded for adjustment by the Base Paymaster. If a will is subsequently received, it must be sent on at once by the D.A.G. Base.

Any Officer or soldier concerned in the burial of any man belonging to the forces will remove the lower identity disc from the body, also the paybook, and any personal effects having a sentimental value, and will attach an inventory of same, upon which will be marked the exact position of the grave, any additional information as to identity obtained from the number of the arms, accoutrement, or equipment of the deceased soldier, and will sign same and forward with all despatch to the D.A.G. Base, through the usual channels

of communication. All ranks are instructed to furnish all definite information in their possession in relation to casualties. Where the circumstances permit, the personal clothing of the soldier should be sold, and the proceeds delivered to the Paymaster, who will credit the amount received to the account of the soldier, entering same in the paybook of deceased, and signing the entry.

When a soldier is mentioned in any despatch, the fact is recorded on his A.F. 103 by the D.A.G. Base, and reported in orders for the unit, in order that the necessary entry may be made in red ink on the soldier's Conduct Sheet.

When a man is evacuated from the theatre of operations, the presence of his name on the Nominal Roll furnished to the M.L.O. will be sufficient evidence to the D.A.G. Base to enter the particulars of his evacuation on his A.F. 103, and return same to the Officer in Charge of Records for his unit. The information that he has been evacuated will also be transmitted to the Base Paymaster and the O.C. Base Depot in order that his accounts and spare field kit may be returned to the depot for the soldier.

The records required to compile the history of a campaign are obtained from War Diaries prepared by every unit and formation in the field, and from the despatches prepared by the Commander.

War Diaries, A.F. C.2118, are kept by every unit, branch of a Staff at Headquarters, and all subordinate commands, Administrative Representatives, and all Commanders of Depots, etc.

The book has a twofold purpose—namely, to keep an accurate record of the operations from which the history of the war can be written subsequently, and to collect information with a view to the improvement of the army as a result of experience gained in the field.

A regular form of cover is issued, upon which the name of

the unit and date of its commencement and finish are inscribed. The book is a confidential one, and is usually kept by an Officer specially detailed in each unit, etc. The records should be brief and concise, but complete in detail. It should record the following information:

1. All important orders, despatches, and instructions, reports and telegrams issued and received, and decisions taken.

2. Daily situation—*i.e.*, arrival at, departure from, or halt at a place; all movements and dispositions on the march, in camp, bivouac, or billets. With large units a "Table of Marches" should be given. At places on the lines of communication, arrivals and departures of Officers and men, animals, stores, transports, etc., should be given.

3. All important matters relating to the duties of the Staff, under their respective headings.

4. All important matters relating to the Administrative Services and Departments, under their respective headings.

5. Detailed account of operations (if these are of sufficient length to be cumbrous in the book, they should be referred to in the main body, and attached as an appendix), noting connection with other units in the neighbourhood, formations adopted, range at which fire was opened, etc. The hour at which important occurrences took place should be entered with exactitude. The state of the weather, condition of roads and ground, and general description of the locality, should be recorded. Clear sketches should illustrate or amplify the account, in order to show the position of troops at important phases.

6. Changes in establishments or strength. As regards casualties, the names and ranks of Officers and the number of other ranks and followers, and animals, should be noted.

7. Nature and description of field-works constructed or quarters occupied.

8. Meteorological notes.

9. Summary of information received, and of all matters of importance, military or political, which may occur from day to day.

10. In what respect organizations and regulations have stood the test of war.

In compiling the War Diaries, duplicate copies are prepared by means of a carbon sheet. Only one side of the form should be used, and the rules for writing orders should be observed—*i.e.*, all names of persons and places and all important words should be written in block letters.

Entries will be made each day, and initialled by the Officer making the entry. Any attachments must be recorded in the main body of the Diary, and appended, being given a letter and a number whereby they may be identified.

On the last day of each month the original copy of the Diary will be forwarded to the D.A.G. Base, for transmission to the proper authorities. The carbon copy will be retained with the unit, but must be kept in such a position that it cannot fall into the hands of the enemy.

In order that the accuracy of the War Diary may be maintained, it is important that all messages, etc., should be passed to the Officer in charge of the Diary, especially during a battle, in order that they may be entered. Where important verbal messages are sent, their text should be communicated to him.

Despatches are sent by the Commander-in-Chief to the Government, in which he presents a concise description of every military operation, irrespective of the size of same. Where the forces employed consist of a number of large formations, the subordinate Commanders will invariably write their descriptions of the operations, and forward them to the Commander-in-Chief. He will either forward them direct, or, where the operations are a part of a larger opera-

tion, he may embody them in his own despatch covering the whole field. These documents are strictly confidential, but the Government may exercise its own discretion as to what part may be published, but in doing so they will be advised by the Commander-in-Chief.

When a subordinate Commander makes a report upon any action, he should embody the following points:

1. Situation and strength of both forces before the beginning of the action.
2. Disposition of the troops and the time when the action began.
3. Orders issued and received, written and verbal.
4. Circumstances of every important period of fighting.
5. Movements of neighbouring units during the fight.
6. The nature and result of the engagement.
7. Names and commands of superior Commanders of the enemy engaged.
8. Plan of intended operations on the night or day following the action.
9. List of casualties, captures, arms lost or damaged, and amount of ammunition expended.
10. Gallant or meritorious actions of individuals or units.

Wherever possible, clear sketches should be attached, as much more can be learned from a well-defined sketch than can be gained from elaborate statements.

Upon completion of the campaign, or, where the circumstances warrant, at some period before completion, a committee is appointed to conduct research into the campaign, and upon the information contained in the War Diaries, and the official despatches of the Commanders, the official history is written.

The application of the data thus provided is not limited to preparation of historical facts, but from the experience gained in the field valuable hints as to organization, tactical

distribution, employment of fire, etc., is gained, and wherever any situation has been particularly unfavourable to our arms, the reasons are sought and worked out for future instruction.

We may take away one dominant lesson from this study, and that is, that accuracy is of the greatest importance in all matters of record, whether of the individual or of the force in the field, either in part or as a whole, since any error may be the means of causing much trouble and labour in a branch of the work that is handicapped badly enough by the personnel constantly changing with whom it must deal. Errors in regard to the individual may be the means of creating gross injustice to the soldier, or often the means of inflicting needless pain upon the relatives of deceased soldiers. So much depends upon the figures that careful checking is necessary, and when one stops to think of the many possibilities of a misplaced figure in working out a total, it will be readily realized that too much caution cannot be exercised.

CHAPTER XXII

CORRESPONDENCE AND POSTAL SERVICE

Rules regarding Field Correspondence—Formal Correspondence—Memoranda—Field Messages—Chain of Communication—Secret and Confidential Documents—Method of Despatch—Censorship—Postal Organization—Collection and Distribution—Sale of Money Orders, Stamps, etc.

THE use of correspondence in the field is limited to absolute essentials, and when written will usually take the form of memorandums written in the Field Message Book, A.B.153, or in the Field Correspondence Book, A.B.152. Messages sent by Signal Service will be written on A.F. C.2121.

The writing of correspondence in the field will usually be confined to messages which are too long for transmission by the Signal Service, and which are sent by despatch-rider, Letter Service, or occasionally by post. Owing to the impossibility of keeping a registry system in the field, units will keep a list of correspondence forwarded and received in a convenient sized book, in which entries showing a digest of all communications will be made. These entries will be limited to a brief summary of the subject of the correspondence, to whom sent, time and date of despatch, and action taken. Similar entries will be made for correspondence received. To facilitate reference to previous communications, a cross-reference system should be used, whereby the sender's number should be quoted from the register, and all future correspondence upon the same matter

should be marked in a special column "See No." In this way, the whole of the proceedings may be traced back to origin. Replies to incoming correspondence should be cross-marked in the same way.

Since many communications forwarded in the field will be written in longhand, it is well to adopt certain fixed rules and to apply them at all times, irrespective of the nature of the document. The rules laid down for writing orders are adaptable to correspondence, and may well be used. The rules that should be strictly observed are as follows:

1. Always keep a copy by means of a carbon sheet.
2. Always write the names of persons and places and all important words in a message in *block letters*.
3. Be brief and concise.
4. Always quote a sender's number.
5. Spell out important figures.
6. Quote map reference when referring to a map.
7. Leave a margin, however small.
8. Put the time of despatch on, after the message has been read, checked, and finally signed—*i.e.*, when actually sending.
9. Never mark a message "Urgent" unless it is really so. Remember the old story of the cry of "Wolf."
10. Use only the official abbreviations, but use them whenever possible. Be sure they are correctly written.

There will frequently be occasions in the field when some matter of more or less importance will demand a more formal communication, but these should be confined to really important matters which are being addressed to a high authority. It may be as well to give the correct method of writing communications of different kinds, relating to the circumstances under which they are written, but they must not be regarded as the normal method of conducting correspondence in the field.

The formal correspondence of peace-time is written on foolscap, and always takes a definite form. Certain rules should be observed, and these are as follows:

1. Always leave a quarter margin on the left-hand side.

2. Place the unit and the place from which the communication is forwarded at the top right-hand corner, followed by the date.

3. The sender's number is placed at the top left-hand corner, and occasionally, though not correct, in the top right-hand corner.

4. Start the address "From," and on the next line "To," Always quote official positions, and not names of individuals, on Service correspondence—*i.e.*, "From O.C. . . . Bn.," "To G.O.C. First Division."

5. State the subject of the correspondence next, giving the branch concerned in the first word—*i.e.*, "Supplies—short issue." This enables the Staff Officer to pass the letter to the correct branch without loss of time.

6. Start the letter with "Sir," without regard to the rank of the recipient.

7. Commence with the courtesy phrases "I have the honour to report," or "I have the honour to submit herewith," or such wording as may be suitable.

8. Always write a separate letter for each subject, except where one matter bears upon another. If more than one department is concerned, forward additional copies, in order that one may be furnished to each extra department concerned.

9. Start a new paragraph for each new phase of a subject, numbering them consecutively.

10. When more than one sheet is necessary, carry the last word of the preceding page over at the top; also give brief identification of preceding page at the top, and number the sheet.

11. Arrange your subject before starting, and write the facts of a subject in their proper sequence.

12. Attach enclosures in the order in which they occur in the letter, identifying them by reference—*i.e.*, “See enclosure No. ‘A’,” and mark each enclosure with a number or letter, clearly.

13. If documents are too bulky for enclosure and are forwarded by separate package, attach memorandum to identify them.

14. Conclude your letter by the following form, which never changes, “I have the honour to be,” and on the next line “Sir,” followed on the next line by the conventional phrase, “Your obedient Servant.”

15. Always sign your letter with name, rank, and appointment.

16. Inscribe the number of enclosures in the lower left-hand corner of last page—*i.e.*, “4 enclosures.”

When replying to correspondence, except in communications to the Commander-in-Chief or the War Office, the reply will usually take the form of minutes affixed to the original documents. When minuting correspondence, the following rules should be observed:

1. Commence letter by marking the original communication in red ink with the roman numeral “I,” and your own remarks with the numeral “II.”

2. Place the date at the top right-hand corner of the portion of the page you intend to use.

3. Commence with the address “To.....”

4. Reply to the paragraphs in the order in which they are written, numbering them accordingly. If no reply to a paragraph in the original is submitted, mark the number and draw a line to indicate that it has not been overlooked. If one reply answers two paragraphs, quote both numbers.

5. Conclude the letter by signing with name, rank, and

appointment. In all very important matters write a letter.

An example of an original letter and minute illustrating these rules is shown. In writing they must be copied exactly as regards form, capitals being used where shown.

COPY OF FORMAL LETTER.

C.M.S./1642/268.

Canadian Military School,
Shorncliffe, Kent,
August 26th, 1916.

From the Commandant,
Canadian Military School.

To the G.O.C., Canadian Training Division,
Shorncliffe.

TRAINING—C.M.S. Syllabus.

SIR,

(Red Ink) I.

1. I have the honour to submit herewith triplicate copies of the syllabus of the above School.

2. Owing to the necessity of adopting the winter syllabus, it has been necessary to change the allotment of hours for outdoor tactical schemes, reducing the previous period by sixteen hours. (See page 5 syllabus.)

3. The allotment of hours for the different subjects has been made with due regard to the strength of the Staff, and with the view of maintaining the instruction of the various classes without increases to the present establishment.

4. In accordance with your instructions, the number of hours allotted to "Bayonet Fighting" have been increased by eight hours. (See page 7 syllabus.)

5. Voluntary evening lectures are being given by the Instructional Departments, and are well patronized by the students. They are conducted between the hours of 7 and 9 p.m.

Respectfully submitted.

I have the honour to be,

Sir,

Your obedient Servant,

W. W. B.,

Lieut-Col.,

Commandant, C.M.S.

3 enclosures.

MINUTED REPLY.

Aug. 27/16.

To the Commandant, C.M.S.

- (Red Ink) II.
1. Syllabus acknowledged and approved.
 2. Noted.
 3.
 4. Allotment is now satisfactory.
 5. Am pleased to hear of enthusiasm of candidates.

M. D.,

Maj.-Gen.,

G.O.C., C.T.D.

Where it is not necessary to use a formal letter, and the amount of substance to be communicated is small, a memorandum may be forwarded on A.F. C.348. This form is divided into two columns, one for sender and the other for reply. The form of heading is as follows:

MEMORANDUM.		A.F. C.348.
Date		Date
From		From
To		To
.....	
.....	

In filling in this form, it is only necessary to give the name of the person "From" and "To." No formalities are used, only the text of the subject, but at the bottom the name, rank, and appointment will be signed. The reply of the recipient will be made out on the form, and returned to sender.

In making out a field message or memorandum where the above form is not used, the form adopted is somewhat similar to that of the formal letter, with the exception that all

courtesy phrases are omitted. The following is an example of a field memorandum, such as may be written in the Field Message or the Field Correspondence Books, and it is in this form that most correspondence in the field will be submitted.

COPY OF A MEMORANDUM OR FIELD MESSAGE.

.....Bn.,
 France,
 16/9/16.

To the O.C. 1st Inf. Bde.
 RETURNS *re* errors in Field State, A.F. 231.

The figures of the State of the 14th inst. have been carefully checked and found correct. The error between that and the State of the 15th inst. has been traced to one man, Pte. R. SMITH, who has transferred to Engineers on direct order from D.A.G. Base, which was not allowed for in preparing State of the 15th.

Regretting the oversight and trusting explanation will be satisfactory,

B. D.,
 Lieut.-Col.,
 O.C..... Bn.

Time 13K.
 D.R.L.S.

It will be seen that the pith of the matter is plunged into without any formality, and the wording of the message is restricted to absolutely essential phrases, whilst the apology for the error, though strictly unnecessary, is couched in complete but brief phrases. This is the form of communication which should be practised and adopted for all field work.

There are certain rules governing the transmission of correspondence. As a general rule, all correspondence is forwarded through the usual channels of command, but occasionally it is permissible to depart from that procedure. The responsibility rests with the writer of a message, but the following rules outlined in the King's Regulations are sufficiently explicit to show the procedure:

1. Important matters requiring the individual opinion of every Officer comprised in the chain of command must

be passed through the hands of Brigade and Divisional Commanders to the G.O.C.-in-C., and, if necessary, to the War Office.

2. Other matters, which do not require the individual opinion of every Officer comprised in the chain of command may be transmitted direct to the authority who has power to dispose of the case, copies or précis of the correspondence being sent to any Officer in the chain of command whom it is considered desirable to keep informed on the subject, but through whose office the correspondence has not actually passed.

3. Routine matters on which it is not necessary for the intermediate Officers in the chain to be informed, and regarding which direct communication is authorized, will be so dealt with.

From these rules it will be seen that any matter which does not require official sanction, or which does not interfere with the prerogative of any superior Officer, may be taken up direct with an Officer higher up in the chain, or who is attached to an Administrative Service under the Higher Commands.

When forwarding communications to a higher Commander, the rule must always be observed that Commanders deal with Commanders, and Staffs deal with Staffs. The signature of the Commanding Officer must be appended to a communication which is intended to be submitted to the Commander of the Brigade, but the Adjutant may sign a document intended for the use of a member of the Brigade Staff.

The use of rubber stamps for signatures is strictly forbidden. All signatures must be written in longhand.

There are certain documents that require careful handling, and for which special rules have been defined. They are classified as follows:

“ Secret Documents ”: These documents are intended for the personal information of the person to whom they are given, and their contents may not be communicated to anyone, without the consent of the original author or the authority of the person who has given the document into the possession of the holder. This rule does not affect a person mentioned in the document, if it is a part of his duty to know the contents. Documents issued by the Naval Authorities, and marked “ Not to be communicated to Officers below the position of C.O. of His Majesty’s Ships,” are to be treated as “ secret ” documents if entrusted to a military Officer.

“ Confidential Documents ” are privileged, and must not be communicated to unauthorized persons, but may only be communicated to those whom it is necessary to inform in the interests of the public service.

Documents marked “ For official use only ” are not to be communicated to the Press directly or indirectly, nor may the contents be communicated to any person not in His Majesty’s Services.

The greatest care must be observed that documents bearing any of these marks do not fall into the hands of the enemy.

Should it be necessary to transmit any of these documents by post or by messenger, special precautions must be taken to protect the contents. They should be plainly marked in red ink in the corner, according to their class, and enclosed in double envelopes. The inner envelope should be addressed to the person for whom it is intended, and the nature of the contents marked clearly in bold red letters across the lower left-hand corner. The outer envelope is addressed in the ordinary way, so that no indication of the nature of the contents can be discerned from the outer covering. The person opening an envelope of this class must personally

present the inner envelope to the person to whom it is addressed.

All "Secret" and "Confidential" documents should be sent by registered post, and receipts must be obtained for them. If a secret document is ordered to be destroyed, a certificate stating that it has been destroyed should be forwarded to the person from whom it was obtained. The destruction should be by fire, and the ashes should be deliberately scattered.

The files carried with field units and formations should be periodically examined and the contents reduced. Documents that are not likely to be again required should be destroyed.

Any documents which are not immediately required, but which may be wanted at some future date, should be transmitted to the D.A.G. Base, marked with the letter "K." meaning "Keep," when they will be filed away with the regimental papers until required.

Papers which are required for purposes of record, whether they be regimental or general record, should be marked with a letter "R." and despatched to the Base, where they will be kept until returned to the unit at the end of the campaign.

Every unit and formation leaving for active service is provided with a stationery box containing all necessary forms and a register for keeping account of correspondence (A.B.193). The Field Message and Correspondence Books form a part of the field kit of every Officer. Refills for these books can be obtained on requisition from the Stationery Depots situated at Advanced Base. All indents for stationery should be forwarded direct, and will be sent periodically, in order that bulk shipments may be made. The packages are brought up by the supply columns and handed over to the train, or they may be sent by postal services.

Indents are made out in any form in the field, but A.F. L.1378 will be used where available.

The general correspondence of the men will be gathered periodically, and after censorship will be forwarded by the Post Orderlies to the Field Postal Section. This will be described under Postal Services, whilst Censorship needs special attention.

Every formation in the field which is situated at a distance from the firing-line or on the lines of communication will maintain a Central Registry, wherein all correspondence is registered on receipt or before transmission. It is not proposed to embody that in this lecture, since the work is such as to require association to be understood. The system of registry adopted throughout the army provides a safe repository for all correspondence in use, whilst files that have been disposed of are put away. File-jackets are provided in which correspondence is laid face upwards upon each other, so that the last communication appears on top. Every document placed in the file is registered on the cover, and the action taken is noted and initialled.

Censorship.—The Commander-in-Chief, through the General Staff Branch, will establish a system of censorship over all means of communication, and will issue such orders as may be necessary in that regard. This censorship may extend to all civil as well as military channels of communication, the extent to which it is enforced being dependent upon the disposition of the population, etc.

In establishing censorship, the Commander-in-Chief will appoint a General Staff Officer to act as Chief Censor. This Officer will be responsible for the control of Censor Services, and will make the necessary arrangements with the authorities concerned in the transmission of communications. In exercising his duties he will be rigidly governed by the instructions he receives from the Commander-in-Chief.

The establishment of a censorship may cover many different phases. The control of communications outside the theatre of operations may involve questions of International Law, and upon such matters as this instructions will be issued by His Majesty's Government. The control of cables, use of wireless by vessels trading in certain areas, etc., must be regulated by an agreement supported by other Governments, and consequently it will be necessary to issue regulations through the Foreign Office. Inside the area of operations, the control of civil utilities will depend upon the degree of hostility evidenced by the population; but as enemy agents will be found amongst friendly inhabitants, the control will have to be sufficiently strong to prevent the transmission of information to the enemy. The Press may be controlled by the Censor, under martial law, and the control of the Telegraph and Postal Services will need consideration. As a rule these facilities will be placed under supervision even when left in the hands of the Civil Authorities for operation. All Press communications will be subject to censorship, and regulations as to the publication of matter will need to be prepared.

The matters which will be excluded are movements of our troops; allusions to the strength, position, state of troops; allusions to the condition of transport, supply, or other services; forecasts of future movements, etc.; and opinions regarding the political or military situation which are calculated to give encouragement to the enemy or to be detrimental to the morale of our own troops. Any of these matters may be deleted, and where a code is suspected the statements may be paraphrased to destroy any hidden sense. If necessary, a message may be stopped altogether.

Censors should be posted at all receiving offices for communications, whether entering or leaving the area, and they

are required to pass upon every communication before transmission. The duties are very important, and those entrusted with them must exercise every ingenuity to prevent the passage of information. Since every device that can be used for the purpose will be tried, they must be specially trained for this work.

The censorship of correspondence submitted by the troops is carried out by certain Officers detailed for the duty in each unit. A Censorship stamp bearing an official number and form is issued to the unit, and is stamped upon the envelope.

The forms which a soldier may use for sending his correspondence home are as follows:

The official Field Postcard, A.F. A.2042, bears certain printed phrases which the soldier may use in conveying his messages. The sentences printed on the form are made to express any condition of health, and to acknowledge receipt of any package. No writing other than the signature of the soldier may appear upon the card. The sentences not required are struck through by a single stroke. No rank or unit may be shown. The card is not liable to any delay from censorship.

Special Envelopes: these envelopes bear a special certificate on the flap, wherein the soldier declares on his honour that the contents do not refer to anything but domestic affairs. This envelope prevents the letter from being delayed in the field, but is liable to censorship at the base.

Urgent Letters, enclosed in special envelopes, A.F. A.2043, which bear the signature of the Commanding Officer of the unit, who personally vouches that the contents are not infringing the censorship regulations. This form is used for urgent private affairs.

Ordinary correspondence, which is liable to delay and censorship. This is usually carried out in a unit by the

Officers appointed, who will sign the envelopes with their names and place the official stamp upon it. Needless to say, the contents of letters must not be divulged by the Officers entrusted with that duty.

The matters which troops are forbidden to disclose are as follows:

Place from which communication is sent.

Plans of future movements, whether rumours or otherwise.

Organization, numbers, and movements of troops.

Armament, of troops and fortresses.

Casualties, other than those which have been officially published.

Any remarks *re* the service of maintenance.

Any effects of hostile fire.

Criticisms of the operations.

All messages written by troops must be "in clear," and the use of any code renders the user liable to punishment. No rank or unit should appear after a signature, but where it is necessary to enclose same, they should be embodied in the main part of the letter.

All mail forwarded by troops must be posted in the military post offices. Troops proceeding on leave or evacuated from the field of operations are strictly forbidden to carry any written messages with them.

The use of diaries, cameras, or other means of preserving evidence of operations, is strictly forbidden.

When a soldier writes any document for transmission by any method of communication, he will present the letter to the Officer responsible for censorship, unsealed. That Officer will examine the contents, and, if satisfactory, will seal the envelope, append his signature, and then place the official stamp upon it. Once an envelope has been

sealed it may not be returned to the soldier. Parcels are examined in a similar way.

Any Officer or soldier is held responsible for any communication which may appear in the Press, whether directly contributed by him, or contributed by friends with or without his consent. Authority to publish any articles on any military matter must be obtained from the War Office. In order to obtain same, it is necessary that duplicate copies of the matter be referred to the Secretary of the War Office, accompanied by a letter signed by the Commanding Officer of the unit of the sender, stating that he has no objection to publication. If the matter is approved, one copy is returned to the sender, with the necessary authority. No mention of the official sanction may be made in the copy when published. No changes may be made other than those of an editorial nature, without fresh permission being obtained.

Postal Services.—The control of the Army Postal Service is entrusted to the Director of Postal Services, who is responsible to the Commander-in-Chief for the conduct of the Military Postal Service. His representatives are situated at the Headquarters of the armies, and at bases on the lines of communication. The Postal Service is responsible for the collection and delivery of all postal matters within the theatre of operations, and for the sale of stamps, money orders, etc., and for the rendering of proper accounts of same to the Chief Paymaster.

The personnel engaged in the Postal Services are distributed as follows:

Base Post Office, which receives the mail in bulk, and is responsible for the division and distribution to the forward bases, and for the supply of postal orders and stamps to the advanced postal authorities.

Advanced Base Post Offices, which are responsible for the

further distribution and forwarding of mails and supply of postal orders, etc.

Field Post Offices, which are attached to trains and formations, and which collect and distribute the mail received from the Advanced Base Post Offices.

Travelling Post Offices, which are located on the railway trains, and which sort and distribute the mail within their respective districts.

Regimental Orderlies, who collect the mail from the Field Postal Sections and deliver same to the regiments.

On the arrival of mail at the Base Post Office it is subjected to censorship, and is then divided up into "roads," in accordance with the direction of the units to which it is consigned. The mail is usually divided into three parts—namely, letters, newspapers, and parcels. Registered letters are kept separate and entered on "X" lists, which accompany the various distributions, and which are signed and returned by each successive post office until receipt from addressee is obtained.

The sorter in charge of each road will sort the letters on his road, and will redirect those which are included in the list of changes which are periodically furnished to him. He will sort the letters into units and then arrange them alphabetically, finally tying them into bundles for despatch. The bundles will be placed in bags for the different routes, the necks of the bags being secured and labelled with the serial number of the despatch and the nature of the contents. The last bag is marked "Final." Where the number of packages for a unit justifies the step, a separate bag will be made up for that unit. Each despatch for an advanced office will be numbered consecutively throughout the month, and the number will correspond with the number on the bag and on the letter bill. The last despatch of a month will be marked "Last despatch for the month of....." The

particulars of each despatch are entered in a register kept for the purpose. The work of the Base Office is divided into three parts:

Correspondence Branch, which deals with the redirection and registration of mail and examination of receipts and records.

Accounts Branch, which deals with the issues of postage stamps, money orders, etc., and renders the necessary accounts.

Circulation Branch, which is responsible for the sorting, distribution, collection, and arrangements for delivery of mail.

Similar preparations are made at the Advanced Bases, the difference being one of degree only. The consignments will be smaller, and will be divided into smaller lots, and redirected on to the respective railheads. Where the bulk of mail warrants the step, a travelling railway section may be used, which will sort the mail in transit. Special arrangements for the use of cars for this purpose will be made by the I.G.C., through the Railway Transport Service. Mails travelling by rail will always be accompanied by a travelling mail guard. At each turnover the mail is signed for in the despatches, bags being accounted for until they are broken up into bundles. Where the time permits, the contents of bags will be checked.

On arrival at the railhead, the mail is taken charge of by a Field Postal Section attached to the Supply Columns, which carry them forward to the Field Branch Post Offices at refilling points, when they are taken forward by the postal vehicles attached to the trains. At the Branch Field Post Offices the mail is distributed to the Postal Orderlies of the units, who are responsible for carrying them forward and distributing them within the unit.

Owing to the many changes in formations that take place

in the field, the Staff of a formation is responsible for supplying a list of changes giving the addresses of the new formations to which units are attached. These lists will be forwarded to the Advanced Base, or, where they are taken off to another route, to the Base Post Office, in order that the bundles of mail for the unit may be redirected by the correct route.

Changes of address for individuals must be made by the unit to which the individual belongs, and all such mail will be redirected at the Regimental Post Office.

Hospital lists of wounded in Hospital will be furnished weekly, and from these the sorters will redirect the mail of casualties. These lists will need constant revision to keep them correct.

Letters for lines of communication troops are delivered from the base nearest to their location.

Letters from troops in the field may be sent free of postage where no postage is available, and no collection is made on delivery. Letters marked "O.H.M.S." and certified by an Officer are delivered free of charge.

Where stamps are available at point of postage, a tax charge is collected for short or absent postage.

The order of collection is the reverse of delivery and follows the same routine. For incoming mail the quantity is reduced at each successive post office, whilst in the outgoing mail the quantity assembles as it passes through the various post offices.

All moneys received for postal orders, etc., are paid in to the Chief Paymaster, through the local representatives, and strict accounting of same made through the counterfoils. The money received through the Chief Paymaster is paid to the Postmaster-General on production of the remittance forms, etc., received from the post offices at point of payment.

In addressing mail or packages for the troops in the field, the following order of address should be observed:

Regimental Number, Rank, Name.

Squadron, Company, Battery.

Battalion, Regiment, or other Unit.

Title of Expeditionary Force.

When an Officer is temporarily detached from his unit, he should send a card, which can be obtained free from any post office, to the Base Post Office, notifying his present address.

CHAPTER XXIII

INTERCOMMUNICATION IN THE FIELD

The Signal Service—Lines of Communication Organization—Organization of Field Units—Method of writing Messages—Rules to be observed—Rules regarding Wireless—Method of Despatch—Despatch-Rider Letter Service—Responsibility of Commanders for Communications.

THE SIGNAL SERVICE IN THE FIELD.

THE Signal Services in the field are under the direction of the Director of Army Signals, who is attached to the Staff of the Commander-in-Chief at General Headquarters. The Signal Services on the lines of communication are under a Deputy Director of Army Signals, who is attached to the Staff of the I.G.C. Representatives of the service are attached to the various formations in the field.

The Director of Army Signals is responsible for the arrangement of signal communication between the Royal Navy and the Army by wireless, and also for the administration and employment of all signal units. Through his representatives he will issue all orders regarding the technical employment of the signal personnel, and for the regulation of signal traffic. The Deputy Director of Army Signals is responsible for the communications on the lines of communication and for the necessary connection between the field forces and those units. A special allotment of signal personnel is made to the Railway Telegraph Department, and all equipment, etc., required for the operation of the railways

will be provided under the direction of the D.A.S. The personnel attached to the railways comes under the control and administration of the D.R.T., but all technical advice needed by that department will be given by the Army Signal Service.

The signal units in the field are operated under the direction of the local representatives with the formation, subject to the technical instructions of the D.A.S. and receive their instructions as to probable requirements from the General Staff Branch under whom they operate. He will advise this branch of any steps necessary to protect the Signal Services, or to regulate traffic to prevent congestion.

The Signal Services will make the necessary arrangements with friendly telegraph or telephone companies, and will take over and operate the lines within a hostile country. The necessary instructions as to the control and use of wireless will be prepared and issued through the General Staff, who will issue orders as to control of communications, and take the necessary precautionary measures to prevent illicit communication with the enemy. The arrangements for the use of wireless by our own forces will be co-ordinated by the Signal Services, acting in consultation with the General Staff. The arrangements for the technical detail will be prepared by the D.A.S. in consultation with the Commander of the Royal Flying Corps and other departments affected by the regulations. Details as to the length of waves and the hours allotted to the various instruments will be prepared by the D.A.S.

The Signal Service is based upon the responsibility of every Commander for establishing communication with his subordinates, but this does not absolve any Commander from the duty of taking steps to establish communication with all units or formations with which he is concerned. The signal units provided with each formation are considered

sufficient for the normal requirements, but the Director of Army Signals may allot extra signal units if the circumstances render this step necessary.

The permanent telegraph and telephone system of the peace administration will form the principal part of the military communications, and steps will be taken in time of peace to record the facilities available in all countries, in order that they may be utilized in time of war. Where a country is friendly toward our troops, it may not be necessary to take over the control of the lines in certain areas, although it will always be advisable to take complete control in the area immediately behind the troops. Where the civil administration is used to operate the lines, it will be necessary to establish a censorship under military control, and a Staff will be attached to see that precedence is given to military requirements. In case of a country being hostile to our forces, it will be necessary to take complete charge of the lines, when the necessary allotment of personnel will be made, and repair and construction units allotted to sections of the lines of communication to keep the lines in working order. It will also be necessary to make arrangements with the G.O.C. Defences to protect the lines, which will usually be done by patrols.

In both of these cases arrangements for the receipt of the civil communications, the order of precedence, and the rules governing the use of the wires, will require careful adjustment, and military supervision will be necessary to see that the rules are observed. In some cases it may be necessary to take over a part of the system for special reasons, but the extent to which the regulations are to be carried and the policy to be adopted toward the civil population is a matter to be decided by the Commander-in-Chief.

The allotment of signal units to the lines of communication

will usually take the form of a number of the following units, varying according to the length of the lines :

A Signal Company, lines of communication, which has a number of detachments included in its strength, and which will be spread over the lines of communication according to requirements. Lines of communication detachments provide a number of motor-cyclists; three telegraph construction parties, composed of sappers and pioneers, with material carried on motor-lorries; and three railway telegraph construction parties, for the care of railway telegraphs. The allotment of detachments is made in the proportion of one telegraph construction party for each army, and one railway telegraph party for each railway organization. More than one signal Company may be needed on the lines of communication.

The signal units accompanying an army are as follows :

To the General Headquarters in the field, one General Headquarters Signal Company, organized to provide communication with two armies; additional men and equipment are added for each army, additional to the force. This unit is intended to operate any existing signal communications in the area of operations between the army and General Headquarters. Motor-cyclists are provided to bridge possible gaps in telegraph or other lines. Such additional units as may be necessary will be added.

Each army has an Army Headquarters Signal Company, which will be composed of the required number of cable and air-line sections which may be necessary and is responsible for the connection between the Army and Corps Headquarters.

Each Army Corps is provided with an Army Corps Headquarters Signal Company, made up in the same way as an Army Headquarters Company, and responsible for connecting the various divisions and the Corps Headquarters.

The cable and air-line sections referred to may be reinforced by certain wireless units. The proportion of each unit in the formation will be regulated by the work. The units themselves consist of the following:

A Motor Wireless Section: This unit can form two wireless stations, which are carried in two 30-cwt. motor-lorries.

A Wagon Wireless Section: This unit carries two detachments having one wireless set each.

Pack Wireless Sections, carrying one set each.

Motor Air-line Section: This unit has two detachments, each capable of construction and operation of five miles of air-line, and two second-class offices. The whole unit can provide material for the erection of 20 miles of air-line, and can supply linemen for the maintenance of 40 miles of line. **A Wagon Air-line Section** has similar equipment and personnel.

A Cable Section: This unit is formed into two detachments, each having one cable wagon, and capable of laying and operating a line of cable 10 miles long, equipped with one stationary and one movable wagon office.

The formations in the Corps have the following units:

An Infantry Division.—A Divisional Signal Company: This unit is organized into four sections. No. 1 Section carries three detachments, each having 10 miles of cable, and three vibrator offices; total, 30 miles of cable and nine vibrator offices. Nos. 2, 3, and 4 Sections each have two detachments, having a total of 8 miles of cable, and ten portable telephones. No. 1 Section connects Divisional Headquarters with the Brigade Group Offices, established by Nos. 2, 3, and 4 Sections, whilst the latter establish communication between the Headquarters of the Infantry Brigade and the Artillery Brigade and the units.

A Cavalry Division.—A Signal Squadron: The squadron is organized into four Troops. "A" Troop carries two

wagon wireless sets. "B" Troop has two cable detachments having a total of 28 miles of cable and eight vibrator offices. "C" Troop has one wagon and three pack wireless sets. "D" Troop has twenty-six bicyclists and six motorcyclists for despatch-riding. The unit is used to establish communication with the forces in rear of the unit, and with the formations and units within the division.

Each Cavalry Brigade.—Each Cavalry Brigade has one Signal Troop which is capable of constructing and operating a line of cable $7\frac{1}{2}$ miles long, with eight telephones. When a Cavalry Brigade is allotted for detached duties, this equipment is augmented by a wireless detachment having two wireless pack stations.

These units represent the different signal units which accompany the forces in the field, but every unit in the field has a proportion of signal equipment with it, in order to maintain communication with its own parts when detached.

The regimental establishment is portrayed on a separate list, and, as will be noticed, consists of equipment suitable to the operations of the force. The Artillery are supplied with cable and telephones, with which they establish communication between the batteries, observation posts, and ammunition depots. The Cavalry and Infantry are equipped with visual signal apparatus, as being more suitable to their rapidly moving forces. A proportion of personnel is maintained in each unit who are trained in semaphore and morse, and who carry flags for the purpose of intercommunication. In addition, bicycles are provided to enable a Commander to establish communication by a despatch-rider service.

The use of the signal apparatus should be controlled, and must not be congested by using the equipment for messages that can be sent by runner, despatch-rider, or letter service. We shall have more to say about the use of the various types of equipment later.

The separate chart shows the distribution of the various units and equipment as it would normally appear in action.

<i>Unit.</i>	<i>Sigs.</i>	<i>Cycles.</i>	<i>Tele- phones.</i>	<i>Cable Miles.</i>	<i>Remarks.</i>
H.Q. Cav. Div.	7	3	—	—	
Artillery	—	—	—	—	
H.Q. Div. Art.	7	2	—	—	
H.Q. Div. Engrs.	—	1	—	—	
Cav. Regt. ..	42	15	—	—	27 semaphoresigs. only.
Div. Cav. Squad.	12	4	—	—	9 " "
Horse Art. ..	—	—	—	—	
Bde. H.Q. ..	9	3	4	4½	Carried on men and wagon.
Do. Batty. ..	7	3	4	5½	
F. Art. Bde. H.Q.	12	1	6	6½	
Do. Batty. ..	7	1	4	1½	
How. Bde. ..	—	—	—	—	As for F. Art. Bde.
Heavy Batty. ..	8	1	6	6½	
Div. Amm. Col.	24	10	—	—	
Field Squadron	15	—	—	—	
„ Troop ..	3	—	—	—	
„ Company	3	1	—	—	
Bridge Train ..	—	1	—	—	
Inf. Bn. ..	17	9	—	—	36 semaphore sigs.
Div. Train ..	—	2	—	—	
Army Trps. Train	—	2	—	—	
Corps Train ..	—	2	—	—	
Cav. F. Amb. ..	4	2	—	—	
F. Amb. ..	6	1	—	—	

Signal Equipment used in Field.

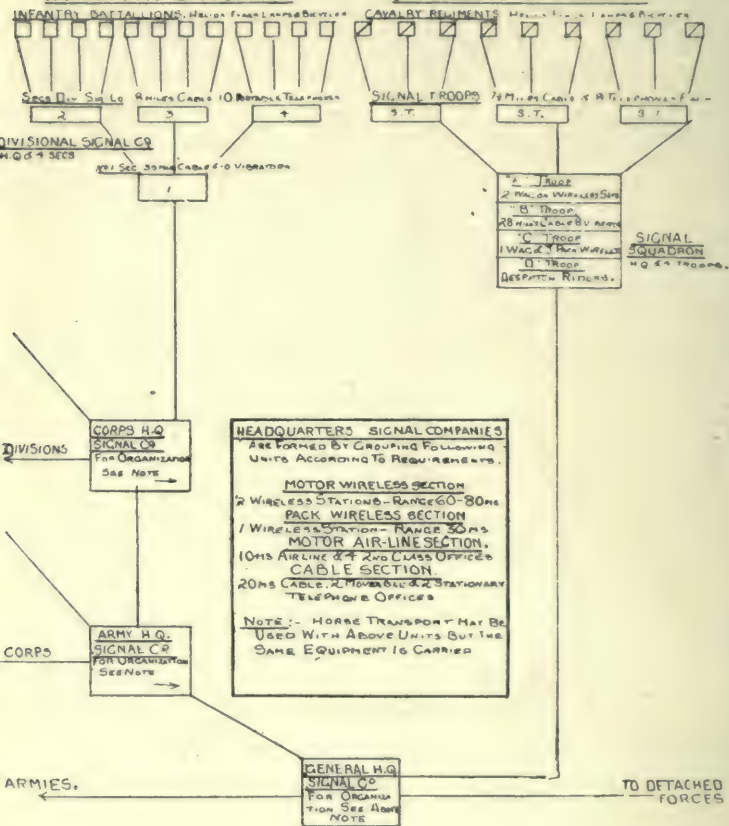
Field Air-line.—Air-line is bare wire erected on light poles. A detachment of twelve N.C.O.'s and men should be able to erect at least 5 miles of line and accomplish an average day's march.

Field Cable.—Field cable is insulated wire laid on the ground. A detachment of eight N.C.O.'s and men can lay the cable at the rate of 1 to 6 miles per hour, according to

SIGNAL SERVICES.

INFANTRY DIVISION.

CAVALRY DIVISION.



SIGNAL SQUADRON
H.Q. & 4 TROOPS.

HEADQUARTERS SIGNAL COMPANIES
ARE FORMED BY GROUPING FOLLOWING UNITS ACCORDING TO REQUIREMENTS.

MOTOR WIRELESS SECTION
2 WIRELESS STATIONS - RANGE 60-80 MS
PACK WIRELESS SECTION
1 WIRELESS STATION - RANGE 30 MS
MOTOR AIR-LINE SECTION
10 MS AIRLINE & 7 2nd CLASS OFFICES
CABLE SECTION
20 MS CABLE, 2 MOVABLE & 2 STATIONARY TELEPHONE OFFICES

NOTE: - HORSE TRANSPORT MAY BE USED WITH ABOVE UNITS BUT THE SAME EQUIPMENT IS CARRIED

NOTES ON EQUIPMENT.
AIR LINE IS BARE WIRE ON LIGHT POLES.
CABLE IS INSULATED WIRE LAID ON GROUND.
HELIOGRAPH RANGE IS LIMITED BY VISIBILITY ONLY.
LAMPS - OIL RANGE 5-8 MS **LIME LIGHT** - 10 IS MS.
FLAGS 3-7 MS ACCORDING TO LIGHT & W.

TELEGRAPH CONSTRUCTION DETACHMENTS
ALLOTTED ONE PER ARMY.

RAILWAY TELEGRAPH DETACHMENT
ONE PER RAILWAY ORGANIZATION

LINES OF COMMUNICATION SIGNAL COMPANY.
3 TELEGRAPH CONSTRUCTION
3 RAILWAY TELEGRAPH DETACHMENTS

g. n. c. o. w.
MAJOR

the nature of the country and the length of time the cable is to lie on the ground.

Wireless Stations.—A wireless wagon station can maintain communication with a similar station at a maximum distance of 60 to 80 miles, and with a pack wireless station for about 30 miles. A pack wireless station can maintain communication with a similar station for a distance of about 20 to 30 miles.

Visual Signalling.—This form of signalling depends largely upon the state of the weather, visibility, and nature of the country.

Heliograph.—This instrument reflects the rays of the sun, and is only limited by the visibility of the two stations.

Flags.—These are of blue for use against light background, or blue strip on white for use against dark background. They may be seen in clear weather from 3 to 7 miles, according to visibility of the stations.

Begbie Lamps.—Used for night signalling, and dependent upon the visibility of stations for range. Limelight can be seen from 10 to 15 miles; oil lamps from 5 to 8 miles.

Despatch-Riders.—Can cover any distance by means of relays. Average speed on good roads is—motor-cyclists, 15 to 20 miles per hour; mounted orderly, 6 miles per hour; bicyclist, 8 miles per hour; runner, 4 miles per hour. These distances are affected by the amount of traffic encountered.

USE OF THE SIGNAL SERVICE.

When writing messages for transmission by signal service, A.F. C.2121 is used. Certain rules must be observed in the construction of the message. These rules should be memorized, as non-observance will result in delay, probably at a time when it is least desired. These rules largely cover those given for field correspondence and those taught in

regard to the writing of orders. By constant repetition, they should become familiar, and consequently they should automatically demonstrate themselves on all messages sent on military service. The rules are—

1. Write all capital names and places in *block letters*.
2. Use the letters AAA to denote full stops.
3. Be brief. Write as though you have to pay for each word.
4. Spell out important numbers.
5. Write important words in *block letters*.
6. Use abbreviations for address to and from.
7. If sending to more than one addressee, give separate copies for each.
8. If you desire to notify several addressees that others are notified, use formula "Repeated to."
9. Never use roman numerals.
10. If cipher is necessary, whole message must be written in cipher, no part being in clear.
11. Never interfere with an operator in his duties.
12. Use despatch-rider service where practicable.
13. Never delay the despatch-riders.
14. Sign receipts for messages with name, rank, time.

In writing out messages on the A.F. C.2121, the form must be filled in the proper spaces as follows: First the "address to," place, sender's number, date of month (spelled out), in answer to (give the number quoted in message of origin).

In the main body of message write short, pithy sentences. Write a legible hand, or block letters in. Keep a copy of message.

At the bottom sign appointment, place, time. In the place allotted to the signature of the addressor, sign your name, rank, unit. If censorship is necessary, censor will sign in lower left-hand corner.

The official abbreviations used are as follows:

General Headquarters	..	..	G.H.Q.
Headquarters of Armies	..	..	First Army, Second Army, etc.
" " Corps	..	..	First Corps, etc.
" " Divisions	..	..	" Div., etc.
" " Cavalry Division	..	..	" Cav. Div.
" " " Brigade	..	..	" Cav. Bde.
" " Infantry	..	..	" Inf. Bde.
" " Unit	..	..	Army List Title.
" " Battalion	..	..	Bn.
" " Regiment	..	..	Regt.
" " Company	..	..	Co.
" " Squadron	..	..	Sqn.
" " Inspector-General of Communications			Communications.
Director of Army Signals	..	..	Signals.
" " Supplies	..	..	Supplies.
" " Ordnance Services	..	..	Ordnance.
" " Transport	..	..	Transport.
" " Railway Transport	..	..	Railways.
" " Works	..	..	Works.
" " Remounts	..	..	Remounts.
" " Veterinary Services	..	..	Vet.
" " Medical Services	..	..	Medical.
" " Postal Services	..	..	Postal.
Deputy Judge-Advocate-General	..	..	Advocate.
Principal Chaplain	..	..	Chaplain.
Provost-Marshal	..	..	Provost.

In forwarding messages, one of three methods may be employed. These are—

The Army Postal Service, which should be used for all returns, general correspondence, etc., which is not of an urgent nature. By the use of this service less work is thrown on the tactical equipment of the force.

The Army Signal Service, which should be reserved for messages which demand immediate delivery. The several means by which messages may be forwarded will be explained in a few minutes.

Special means, such as by aircraft, Staff and Orderly Officers. This method is restricted to the use of Staffs of formations, and is only resorted to in the most urgent circumstances. Regimental cyclists, however, may be utilized as a normal means of communication, or regimental runners. They would be stationed at the headquarters of the regiment, and representatives may be located at Brigade Headquarters with advantage, since a chain of communication for ordinary purposes is thereby established.

The Army Signal Services, the subject of this lecture, may establish several chains of communication, but every Commander must realize his own responsibility regarding the maintenance of communication, and must make every effort to keep same intact when once established.

The several channels of communication controlled by the Army Signal Service may be summarized as follows:

Despatch-Rider Letter Service: This service is established by providing a series of regular routes operating upon a fixed time-table, and covering a distance of many miles. Relays may be established, the messages being concentrated at central points and then redistributed over other routes to their destination.

Signal Wire Service: This system is built up by the various cable, air-line, and lines of communication telegraph services. The use of the wires needs strict control, otherwise there will be congestion at the various stations. Several chains of communication may be laid, but every effort must be made to restrict the mileage of cable or other line laid, since the advance of the troops may leave the force unsupported by lines, owing to the time required to reel up.

Wireless Communication: This system must be rigidly controlled, and requires the preparation of elaborate time-tables in order to leave the stations open for urgent messages, such as those transmitted by aerial reconnoitring forces

or advanced cavalry formations. The system demands that all messages should be sent in cipher to avoid discovery by the enemy; consequently it is necessary to provide a Staff for coding and decoding messages.

The Army Postal System has already been described in the previous lecture, so we shall say no more about it here, except to again point out that this system can be used without any loss of efficiency to the field intercommunication.

In regard to the Despatch-Rider Letter Services, routes should be prepared to the various headquarters of formations. These routes may pass through the various commands in the army, eventually reaching the General Headquarters. In establishing the system, definite routes must be allotted for riders and the necessary reliefs provided. As a rule, this system is not available for night service. Mounted orderlies may be used on similar duties, their routes corresponding, except for distances. The distance to be covered will decide the number of relays to be employed, but they should not be a greater distance apart than one hour's journey for the class of rider employed. Arrangements for the supply of petrol, rations, etc., may be necessary, and the posts established should be located at easily found points. The position of these places should be notified in orders, so that formations moving on other lines in close proximity may be able to intercept despatch-riders at cross-roads, etc., in order to use the chain of communication. If a force moving on a parallel route is sufficiently large, a service would be established to meet their needs. The relay posts which are used would be located at central points, so that the despatches from several routes in advance can be concentrated at one point. In this way the routes from the divisions in a corps may be assembled at a point where they would be taken forward for the whole corps from one station by means of army despatch-riders. The system of relay

should be such as to reduce the mileage covered by the various formation services to reasonable distances from their own commands.

At every post there would be a responsible Officer or N.C.O. in charge, who would register the packages as they arrive, recording the rider, and issuing them to another rider. He will note the time of receipt and despatch in the register. As a rule, the termination of the forward route would be at the section of the Divisional Signal Company with the brigade groups, from which they may be carried back to the divisional section in one relay, and thence by corps riders to a central point, where they would be collected for the armies.

Officers sending despatches by riders will take care not to delay the messengers, and will sign the route sheet, quoting the time, and initialling the same. Every letter must be registered at the various stations; therefore, where there are several letters for one headquarters, they should be placed in one package, thereby reducing the time required to register them. On arrival at the next relay, the messages are registered, those for one route being assembled and handed over to the next relay, and so on until all messages are despatched. Despatch-riders are forbidden to carry parcels; they are not intended to displace the supply or postal parcels service.

Messages to be transmitted by wire or signal should be handed in on the form already referred to, A.F. C.2121. The Officer or N.C.O. in charge of the signal station will read the message over, and ask for any explanation that may be necessary as to wording, etc. Where the phraseology used is too verbose, and it appears to the signaller that it might be reduced to facilitate despatch, he should ask the sender if the brief message would do as well, explaining the reason for asking. If satisfactory, he should get the sender to rewrite the message on a form, and sign same. Messages will be despatched in the order in which they are received,

with the exception that certain classes of message may be given precedence under the following rules.

Messages marked with either of the following classes must be given precedence over other messages of a lower class:

1. Urgent Service Messages, regarding the working of the line, and marked "Urgent Signal." These messages can only be sent by a signal operator.

2. Messages O.H.M.S. marked "Priority." These messages may only be sent by an Officer authorized to do so, a list of the persons authorized being furnished by the Staff to the Signals.

3. Service Messages connected with the operation of the lines.

Messages coming under Classes 1 and 3 may only be sent by the signal operators, since they are concerned with the operation of the line. Class 1 will only be sent to deal with very urgent matters.

The authority to send "Priority" messages will be sparingly granted, the names of those authorized being published in Standing Orders, and a list furnished to the signal stations affected by same. It may occasionally happen that an Officer may be called upon to send an urgent message, and he may use the "Priority" signal, but he must be prepared to support his action by showing the real necessity.

Private messages will not be forwarded until all military messages are despatched.

As each message is received, it is entered in a register kept for that purpose, showing names of sender and addressee, date and time of receipt, and time of despatch. Corresponding particulars are entered on the signal form, in the space reserved for "Service Instructions." Messages are despatched with regard to their urgency as has been described.

At the receiving station the message is taken down upon the Army Signal Form, duplicate forms being made by means of a carbon sheet. A prefix is used in the code number of the message, whereby the receiving station knows at once whether the message is one for transmission by wire or delivery from the station. The carbon copy is placed in a special envelope, A.F. C.398, if it is for delivery, the original as written by the receiving operator being retained in the possession of the Signal Service. The message is then sent by orderly, and a receipt obtained upon the envelope.

Should a message be received at a station written on ordinary paper, the original message is pasted to the regular form, in order that the service instructions can be attached.

Messages to be despatched by wireless are subject to special rules, and usually this form of service is retained for use between the signal units attached to Headquarters, so that most messages will emanate from one Headquarters for transmission to another. Wireless is not used for the ordinary routine traffic. All messages sent by wireless must be enciphered. As a rule, the various Headquarters will have a code call, and this will suffice for the address. Should the message be for some other unit than the Headquarters, the address will be enciphered by the Signal Service. The use of the code obviates the necessity of transmitting the address as written. The receiving station will write out the address of the formation of origin, for the information of the recipient. If it is necessary to state the place from which the message was written, it must be embodied in the body of the message. If for any special reason the Officer sending the message requires the address "to" and "from" to be sent in clear, he will write the words "in clear" after the address. The sender's number, day of month, and in answer to, are never enciphered. Care must be taken to destroy all paper which has been used to encipher or decipher a

message. The use of wireless will be strictly controlled, and special hours for the use of certain sets will be allotted, the length of the wave being regulated to avoid jamming.

Wireless will usually be used by Cavalry forces who are acting at a distance, aircraft on reconnoitring duties, and between the various Headquarters of large formations. Where naval forces are co-operating with the army, special rules will be drawn up in that regard.

Plans showing the different channels of communication will be prepared by the representatives of the Army Signal Service, and will be corrected from time to time.

Supplies needed for the signal units will be carried up by the supply columns and trains, and will be drawn through the Headquarters to which they are attached.

Subject to the directions of the Commander-in-Chief, conveyed through the I.G.C., private messages may be transmitted on payment. All moneys received will be accounted for through the local Pay Officer, and accounts rendered as in the case of moneys received as an Imprest-Holder, and described in the lecture on Pay.

A tariff is prepared and published fixing the rate per word for messages within the theatre of operations and for foreign messages. The franc is the standard of value for all international messages. By special arrangement, Press messages may be accepted from accredited representatives, payment for the same being made on warrants issued for the purpose.

A Signal Clearing House is established at the base, to which all message forms are despatched daily, passing through the Headquarters of the unit. The Clearing House keeps record of all messages sent and received, and all charges for private messages.

The work of the Signal Service being intimately connected with the operations of every force in the field, it is

incumbent upon every soldier to give every assistance to the signal personnel. Every aid should be given in protecting the equipment. Where cables have been laid, the troops should lose no effort in protecting them, if necessary placing them in positions of safety. Any breaks in a line that may be noted should be reported to the nearest signal representative without delay. The messengers of the Signal Service should be looked upon as men who cannot be delayed, and wherever the help of the troops can assist them in getting to their destination, they should give it readily, and when concerned in the receipt or despatch of messages, should be particularly careful that they do not delay the messenger one moment longer than necessary. It is well to remember that the bag of a despatch-rider may contain many documents of vital importance passing over your route, and whilst the message you receive may be of little moment, it must not be looked upon as an indication of the complete contents of his bag. If a time is set for a delivery, take special care that the bag is always ready punctually at that time. If the rider is late, the fault may not be his, but may be accounted for by difficulties with the traffic. When sending signal messages, write briefly, and cultivate the habit of regarding every word as so much out of your own pocket, when you will be less inclined to be verbose. Above all, reserve your signal lines for matter that cannot be sent in any other way.

CHAPTER XXIV

ENGINEER SERVICES

Lines of Communication Organization—Responsibility on the Lines of Communication and in Field—Engineers in Relation to Other Arms—Bridging—Mining—Field Fortifications—Distribution of Tools and Material—Explosives.

THE Engineer Services in the Field may be classified under two main parts—*i.e.*, those connected with the lines of communication which are of more or less a permanent nature, and those in the field which are connected with the operations. The first of these will be under the supervision and direction of the Director of Works, who will receive his instructions from the I.G.C., whilst the second is under the immediate supervision of the Engineer Headquarters attached to the various Headquarters of the formations in the field.

The Director of Works is responsible for the construction and maintenance of all buildings, offices, camps, etc., occupied by the troops on the lines of communication, and for the provision, construction and maintenance of utilities required for the successful operation of the lines of communication work, such as power, light, water, etc. The allotment of Engineer personnel will vary according to the need, but a definite number of Works Companies, R.E., will be given to the Director of Works for these services. The Works Companies consist of a number of mechanics and artificers, the trades represented being those required for these duties. Local labour may be hired, subject to the directions of the

I.G.C., and workshops, plants, etc., will be established at convenient centres. At the different bases there will be the greatest demand for skilled Engineer labour, and consequently each base will have its own Engineer workshop. As is the case with all other services, representatives of the Director of Works are located at the various bases and on the different sections of the lines of communication. The chain of communication will be through them in each case.

The Director of Works is also responsible for the accumulation of all supplies needed by the troops in the field, and arranges for the transportation of same, through the I.G.C. He may be required to establish workshops for the construction of certain articles of equipment, which are forwarded direct to the front when needed. He will be advised by the I.G.C. as to all requirements. The extent of his work cannot be fully explained in the compass of a lecture, but if we try to realize the many hundreds of items in regard to the construction and maintenance of buildings and industrial facilities, and think of the number of depots which we have discussed in previous lectures, it will not be difficult to form some idea of the importance of the department which is responsible for the provision of the skilled personnel to carry out the work.

Supplies for the Engineers in the field, other than those carried by the Ordnance Services, are concentrated at a Base Engineer Park, from which they are distributed to the Advanced Engineer Parks, being taken to railhead by railway tonnage allotted through the I.G.C., and carried forward by road transport detailed for the purpose, where the quantities are too bulky or heavy for the Ammunition Parks, as would be the case with barbed wire, timber, mining material, etc.

The Engineer Services in the field are controlled by the various Headquarters of the formations, but the technical

matters are handled by the Engineer-in-Chief on the Staff of the Commander-in-Chief, who issues his instructions to his subordinates of the Engineer Headquarters with the formations. Each army, corps, and division has an Engineer Headquarters attached to it, the operations of the Engineer units with the formations being directed by these Headquarters.

It must not be supposed that the Field Engineers are responsible for all the actual labour which field engineering entails, because they are really only responsible for the advice and material necessary to construct proper defences, obstacles, etc.

Where defences require skilled labour, or where they are of a complex nature, the Engineers undertake the actual construction. To bridge a stream, repair a bridge, or to destroy enemy obstacles or defences, and to construct obstacles for their own use, or to destroy bridges, etc., to impede the enemy, requires technical knowledge, and this is provided by the Engineers. To handle a subject which has as many phases as that of the Engineer Services, it is necessary to divide your subject into two parts: first, to show the available personnel; and, secondly, to enumerate some of the more common tasks which they are called upon to perform. We will adopt this method, and will commence with the available personnel. We will give the formations and the units attached to them, starting with the forward troops.

A Cavalry Division.—1 Field Squadron, R.E. This unit has a Headquarters, Bridging Detachment, carrying 8 tripartite boats for fording streams and 4 troops, each of which carries 24 sets of digging tools and technical tools, explosives, etc.

A Cavalry Brigade, detached for Operations.—1 Field Troop, R.E. Has Headquarters and 4 Sections. Carries 35 sets of tools and 2 collapsible boats for fording streams.

An Infantry Division.—3 Field Companies of Engineers. Each Field Company has a Headquarters, Bridging Detachment, and 4 Sections. Each Section carries 40 sets of tools, technical equipment, and explosives. Bridging Detachment is capable of constructing 75 feet of medium bridge.

1 Pioneer Battalion. This unit is not an Engineer unit, but is a fighting unit, specially trained for light-engineering, and carrying 500 sets of tools. It provides a working force of 1,000 men, available for the construction of field defences.

With Corps Troops.—Pontoon Park. This unit carries bridging materials sufficient to construct 210 yards of pontoon medium bridge and 40 yards of trestle bridge.

Field Searchlight Sections are provided, which carry lights of varying power, with equipment for operation.

With Army Troops.—Tunnelling Companies have Headquarters and 4 Sections of 4 Reliefs each. Each Relief has 1 N.C.O. and 20 sappers. Special mining tools and frames are carried in the transport.

Fortress Company, R.E., carries tools and special equipment for the construction of more elaborate field fortifications than those built by the Infantry or the pioneers. The working party consists of about 100 men.

Attached to Headquarters of Formations.—Topographical Sections, who are responsible for the improvement and preparation of plans, sketches, maps, etc., and also for photographic development.

Printing Sections. These units carry printing presses for the preparation of circulars, orders, etc., issued by Headquarters.

Attached to the Lines of Communication.—R.E. Companies provide technical labour in reliefs of 50 men each.

Railway Construction Companies, formed from specially trained troops, for repair and construction of railways.

Engineer Parks, formed for the collection and distribu-

tion of tools, materials, etc., for the lines of communication and the field forces.

The duty of the Field Engineers in an advance is to repair bridges, remove obstacles, etc., and assist the advance of the main body. They will be detached to accompany the Advanced Guards, the Engineer Headquarters with the formation being responsible that sufficient technical equipment is provided to enable the required services to be completed so that the main body is not delayed.

In occupying a position, the Engineers are responsible for giving technical advice as to the construction of defences, the assembly of sufficient tools for their construction, and, where necessary, the construction of special fortifications. Obstacles that must be removed will be handled by the Engineers. During the occupancy of the position, the Engineers are responsible for the construction of second-line and other defences, and for the preparation of material required in the fighting-line. The provision of Engineer stores required by the advanced troops and their collection will be supervised by them, the carrying parties being detailed from other troops.

In a retirement, the Engineers are responsible for the construction of obstacles, demolition of bridges, roads, etc., in accordance with instructions received from the Commander, and will be allotted to the Rear Guard in sufficient proportions to enable them to rapidly destroy all advantages which would assist the advance of the enemy, as soon as the last of our own troops have been cleared.

In siege warfare, the Engineers are responsible for mining, sapping, etc., utilizing their special equipment, and directing the operations of the Infantry in regard to the latter. In this form of warfare their special knowledge of field fortifications makes them invaluable to the Infantry in preparing schemes of defence, entanglements, obstacles, drainage, etc.

The different duties which have been enumerated here will vary in every operation, and the only practicable way in which to appreciate the duties of the Engineers will be to take the different matters with which they must cope, and explain the system of administration and, briefly, the construction.

In an advance one of the first matters which they will be called upon to do will be to remove obstacles prepared by the enemy retiring forces. In doing this they may have to resort to the use of explosives, but usually they will only be called upon to use the tools carried with the unit. These tools are clearly shown in the accompanying table of tools and explosives.

The destruction of bridges is one of the expedients which the enemy will adopt in trying to retard our progress. The material available for the construction of bridges has been briefly described in our summary of units, but we must ascertain exactly what is meant by the different descriptions.

The Cavalry screen which a Commander throws out in advance is endeavouring to seize all strategic points, and to get inside the corresponding screen on the enemy's side. As has already been explained, mobility is vital to them, and they cannot be hampered by the tonnage which bridging trains must carry. Their equipment is limited to the tripartite boats already referred to. The Cavalry Regiment carries an air-raft equipment, composed of inflatable canvas bags, to which a superstructure is attached. This equipment is sufficient to carry limber wagons, the horses being swum across the stream. A light boat is carried in two valises, and by its aid a tow-line is carried across the stream, and by means of the rope the animals are guided across. By means of this equipment the advanced Cavalry is able to throw a protective screen across the river pending the

construction of more substantial equipment for the main body.

The eight tripartite boats carried with the Field Squadron, R.E., with the Cavalry Division are used to construct a raft capable of carrying any horsed vehicle or gun accompanying the division. Animals cannot be carried, but must be swum across. The boats are collapsible, and can be opened by two men, the seats holding the boat open and rigid. By means of the superstructure, light bridges can be constructed to cross narrow streams, but they are only intended for fording purposes. The division may be got across by means of this equipment, but the progress will naturally be slow.

With the Infantry forces are the Field Companies; each carries sufficient material to construct 75 feet of medium pontoon or trestle bridge. Medium bridging is capable of carrying men in fours, horses, field artillery and similar loads. Light bridging is capable of carrying small numbers of men only, and is usually constructed of improvised materials. Heavy bridging takes twice the time of medium bridging to construct, and is capable of carrying any vehicle which accompanies a field force. It can take a lorry weighing up to $7\frac{1}{2}$ tons. The quantity of heavy bridging that can be constructed with the field equipment is approximately one-half of that laid down for the medium bridge. The latter is the normal bridge required for the field forces, the passage of which will be a matter of speed in crossing. Subsequently permanent bridges would be constructed by the heavier trains, later being replaced by special materials prepared and brought up.

The Field Companies would accompany the advanced troops, and by means of the equipment carried in the bridging section would construct the bridge for the passage of the force. Where the situation is extremely favourable,

the banks being good and not too steep, a pontoon bridge could be thrown across a stream at the rate of 50 feet in two hours, or even less where the use of trestles is unnecessary. In constructing bridges several methods are adopted. They are either "formed up" by constructing the pontoons in succession at the head of the bridge, dismantling in the same way, but working in the reverse; or they may be formed into rafts or sections and floated into position. In some cases they may be completely built alongside the shore, and then swung into position. A method not often adopted is that of constructing a section and then pushing same forward, another being constructed behind it. This method is called "booming."

The construction of bridges from the standard material carried with the unit is practised in time of peace, and consequently can be carried out in war with deliberation. Other forms of bridging are also practised, such as cantilever, suspension, improvised barrel pier bridges, etc.; but as these types are consequent upon the necessary material being available, we shall not discuss them at any length.

Should the span to be bridged be too great for the equipment carried with the Field Companies, the Corps Engineer Headquarters would advise the Headquarters of the Corps, when they would attach the Pontoon Park to the forward troops, in order that they may construct the bridge before the arrival of the main body, or as soon as is practicable. Meanwhile, some troops would be forded across, and would establish the necessary protection, under cover of which the Pontoon Park would proceed with its work. With the very best of conditions, it would take this unit from 1 to 3 hours to construct a 50-foot medium bridge, whilst 100 yards would take from $2\frac{1}{4}$ to 4 hours, and 200 yards from 8 to 10 hours. The number of trestles required affects the time needed. At night it would take almost twice as long.

A number of improvised rafts may be constructed from the equipment carried in the field, and most units receive training in their construction and use. Many of them are portrayed in the Field Service Pocket Book, and form an interesting and useful novelty for the instruction of troops.

During an advance the troops will occupy different encampments, etc., and the provision of water will often fall to the lot of the Engineers. Pumps are carried in the different field formations for this purpose. The pumps are carried with each section and troop of the R.E., and are capable of lifting and forcing to lift 60 feet. These pumps are able to supply 600 gallons per hour with four men at work, the quantity increasing as the lift decreases. In addition, canvas hose for attachment to water-taps and tapping tools for water-mains are carried.

When troops are engaged with the enemy and under fire, the troops dig themselves into the ground in order to procure cover from fire, and to develop the maximum use of their weapons. They will usually dig hasty cover by means of the entrenching tool carried by every infantry private and pioneer, and the position selected will usually be the limit of advance they have been able to make. The Engineers here give skilled advice as to the most suitable positions for entrenchment, and assist in the tracing of the trenches and collection of the tools for the work. If the original position is suitable, the hasty cover provided will be improved and connected into the form of entrenchments. During the period of development the Engineers will concentrate materials for consolidation of the position, in order to protect the troops against possible counter-attacks. Since the Cavalry duty is essentially that of reconnaissance, the number of tools carried by a Cavalry Division is small. As soon as the Cavalry are held up, they are relieved by the

Infantry, who will proceed to consolidate the position, the Cavalry being withdrawn behind their protection until able to move forward again. The work of constructing defences will therefore fall principally upon the Infantry forces. As has already been stated, the infantryman carries an entrenching tool as part of his field equipment. In the Infantry Battalion wagons, there are additional digging tools, consisting of picks and shovels, with a proportion of cutting tools which may be utilized. The Infantry Brigade Headquarters carries 500 sets of tools, so that a brigade has 900 sets of picks and shovels, exclusive of wagon sets or spares to replace breakages, the proportion of picks being 75 per cent. of that of the shovels. In the Field Companies an additional 160 sets are carried, being distributed in the proportion of 40 sets to each section. Working parties would be detailed from the reserves of Infantry to construct defences, Engineer sappers supervising the work according to the instructions issued through their own Officers. Any special points requiring technical defences would be constructed by the Engineers by means of special parties. Meanwhile, carrying parties would be detailed to bring up wire, stakes, etc., for the construction of obstacles. Where there are any obstacles in front, such as houses, etc., which are to be demolished, the Engineers would undertake the duty.

Plans would be prepared, for which drawing instruments are provided, and survey materials and equipment are carried with each section of the Field Companies and Squadrons.

If the situation developed into a prolonged battle, the Engineer units attached to Corps and perhaps Army Troops would be pushed forward, when saps and mining galleries would be commenced, in an attempt to get forward and dislodge the enemy, the consolidation of the position being proceeded with meanwhile.

TABLE IX.—TOOLS AND EXPLOSIVES CARRIED BY FIELD UNITS.

Unit or Formation.	ENTRENCHING TOOLS.				CUTTING TOOLS.						MISCELLANEOUS.		
	Shovels.	Spades.	Pickaxes.	Felling Axes.	Hand Axes.	Billhooks.	Hand Saws.	Cross-Cut Saws.	Reaping Hooks.	Folding Saws.	Crowbars.	Gun-Cotton with Primers.	Sandbags.
Cavalry Regiment ..	18	—	12	13	7	12	4	—	36	3	3	105	150
" Squadron ..	6	—	4	4	2	4	2	—	12	1	1	35	50
Divisional Squadron ..	18	—	12	13	7	12	4	—	36	3	3	105	150
Horse Artillery Brigade ..	84	12	48	12	—	48	36	—	74	—	2	—	—
Field " 18-pdr. ..	126	18	72	18	—	72	54	—	58	—	1	—	—
Howitzer Artillery Brigade, 4.5 inch ..	—	144	72	27	—	72	54	—	46	—	1	—	—
Heavy Artillery Battery ..	16	—	8	—	—	8	8	—	12	—	4	—	—
Field or Howitzer Artillery Battery ..	30	6	18	6	—	18	12	—	12	—	—	—	—
4.5-inch Howitzer Battery ..	—	36	18	6	—	18	12	—	12	—	—	—	—
Field Troop, R.E. ..	37	7	39	25	14	18	16	2	6	4	6	292½	264
" Company, R.E. ..	111	19	107	47	28	39	27	4	10	8	8	570	852
" Section, R.E. ..	48	6	44	16	10	14	10	—	—	—	—	182	300
Pontoon Park ..	40	40	40	40	—	40	4	—	8	—	—	—	—
Headquarters Infantry Brigade ..	568	—	368	—	1	—	—	—	3	—	9	—	—
Infantry Battalion ..	110	—	76	16	8	40	1	—	20	32	8	—	—
Pioneer Battalion ..	520	—	640	176	8	200	25	16	20	72	32	727½	1,000

NOTES.—Wagon and Cart Equipment, G.S. and R.E. Wagons and Maltese Carts carry on each vehicle 1 pickaxe, 1 felling axe, 1 billhook, and 2 shovels.
 Each Machine-Gun Tripod has as part of equipment 1 pickaxe, 1 shovel, and 1 billhook.
 Infantry Battalion M.G. Section has 60 sandbags.
 Telephone Wagons carry 1 pickaxe, 1 felling axe, 1 billhook, 1 spade.

The construction of military roads leading to the area occupied by the troops is an important part of the work of the Engineers, the necessary manual labour being provided by either Labour or Pioneer Battalions, who would be supervised by the Engineer Staffs.

The troops are responsible for the construction of the necessary latrine, kitchen, incinerator accommodation, etc., but it will occasionally be necessary for the Engineers to provide special equipment, especially in regard to drainage.

In consolidating a position, deliberate entrenchments will usually be constructed, for which purpose the plans will be prepared by the Engineer Staff. Working tables showing the amount of labour required, quantity of tools, and special equipment, must be prepared, and the necessary additional labour procured through the Staff. As a rule, the Engineer Companies are allotted to Brigade Groups, and will deal directly with the Brigade Staff in regard to labour, etc. The plans of the various groups will be considered with due regard to the plans of neighbouring units, in order to make the work a part of one grand plan.

The tools carried by the various units may be pooled under these circumstances, the Engineer Companies establishing Tool Depots, from which tools will be drawn by the working parties. The work will be traced out by means of tapes, the men being led on to their tasks, and supervised whilst working by the Engineer personnel. The Officers of the battalion supplying the labour are responsible for the discipline of the men, and must co-operate with the Engineers in getting the work done.

Special frames for the construction of dugouts, trench walks, firing steps, revetting material, etc., will be prepared at Engineer workshops established by the Companies, through which all material will be issued. Wire for entangle-

ments, stakes, portable wired cradles, etc., must be made, and supplied in accordance with the necessity of any particular part of the line.

If a condition of siege warfare is developed, the Fortress Companies will be pushed forward from the Corps and Army Troops, and will reinforce the Tool Depots with their tools, and provide additional technical labour for workshops.

Tunnelling Companies will be employed to construct galleries for use as mines to destroy enemy positions, or, where the enemy is conducting mining operations, to prepare and fire camouflets to destroy his galleries. These Tunnelling Companies are formed from specially trained men, and are equipped with the special tools required by miners. The necessary shoring material and frames required for the use of the miners will be constructed in their own workshops established in rear of the mining positions, or by the Field Companies, when they are available for this work. It must be remembered that the operations are one grand whole, and consequently no fine line of duty may be drawn by any unit, but all must work for the common good.

The use of explosives is nominally the duty of the Engineers, but small quantities of explosives are carried with certain units. The accompanying table of tools and explosives will show the quantity carried by each unit. Additional supplies are drawn through the Divisional Ammunition Column, the Headquarters of which carries a reserve supply, subsequent supplies being delivered through the ordinary chain of ammunition supply, which has already been described.

The explosives used for military purposes have certain features, which are applied according to the needs of the occasion, the peculiar properties being adapted to the purpose for which the explosion is arranged.

The explosives are classified into two main groups, which are—

1. Low explosives (non-shattering).
2. High explosives (shattering).

The first class consists of slow-burning substances which may be started by a flame, the process of development of the gases being slow. Black gunpowder is an example of a low explosive. Occasionally a proportion of high explosive is mixed with the low explosive, in which case it will require more than a flame to start combustion. The use of low explosives is confined to a general distribution of force, wherein the aim is to disturb all the material in the vicinity, as when exploding a mine, the soil for a distance being generally pushed or tumbled, with the result that any gallery in the vicinity will be crumbled.

The high explosives are used where it is desired to give a shattering and powerful local effect. In these explosives it is necessary to cause combustion by detonation of some other explosive, when the whole is instantaneously turned into a gas which by expansion produces the shattering effect. High explosives are therefore used in destroying any material. They must be placed in close contact with the object to be destroyed, as a small space between may be sufficient to negative the effect of the sudden explosion and consequent expansion of gases.

Explosives used for military purposes must combine the following essentials: safety in transport, stability under all climatic conditions, simplicity in use. Where the explosive is to be used in mining, it should be free of poisonous gases on combustion. The common explosives used for military purposes are as follows:

Gun-cotton, a high explosive, supplied in slabs of about 1 pound in weight. The slabs are carried in a wet form,

containing a degree of about 15 to 20 per cent. of moisture, and packed in sealed tin cases which are enclosed in wooden boxes. To explode gun-cotton it is necessary to use a primer, which is composed of dry gun-cotton. The slabs have a hole bored in the centre, into which the dry primer, which is circular in shape, is fitted. The primer has a small circular hole in the centre, into which a detonator is inserted. The detonator contains a proportion of fulminate of mercury. Wet gun-cotton may be safely handled, cut, or sawn, but when dry it is extremely dangerous to handle. If gun-cotton is exposed to sunlight it will deteriorate. The method of firing the different charges does not concern us from the administrative point of view, and we shall not discuss it here. Instructions may be found in the Field Service Pocket Book.

Nitro-glycerine forms the basis of such substances as dynamite, blasting gelatine, etc., but may be supplied in liquid form, although this is not a suitable form for military use. It is dangerous stuff to handle, owing to the sickly fumes which it produces, and even handling will often produce a form of sickness. It is a high explosive, which is fired by detonation. It will freeze at about 40° F., and will remain frozen at even higher temperatures. It is safer when frozen, but it is liable to shatter and not explode when detonated whilst frozen.

Dynamite is used in two forms, the first being that in which a base for the absorption of nitro-glycerine is used, in which the base remains inert, the full force of the high explosive nitro-glycerine being obtained. This is the more powerful of the two classes. The second class contains an admixture of some other explosive, such as charcoal, gunpowder, gun-cotton, etc., the base in this case being active, producing what might be termed a double effect, such as is used in "blasting gelatines," where the violent effect of the

nitro-glycerine is unnecessary, the other constituents providing the main part of the force.

Dynamite is not a satisfactory military explosive, owing to the difficulty of exploding it when frozen, and the ease with which it freezes, and the liability to deteriorate when exposed to the weather. A detonator of fulminate of mercury is used, though in case of emergency it may be detonated by firing a rifle bullet or other violent impact. It requires very careful handling.

Blasting gelatine is much better for military purposes, since it is not so susceptible to damp. When frozen it is very sensitive, and liable to detonate when struck a sharp blow. It can be carried in water like gun-cotton. It requires a strong detonator to fire it, and when used requires to be confined in order to get the maximum power.

Gelatine dynamite is a composition which is midway between the last two. It is very sensitive to a blow, but is slow in its action. It is detonated in the same way as dynamite.

Picric acid explosives are used for bursting charges of shells, etc. It may be burned in an unconfined state, without any result other than production of fumes. When mixed with certain metallic salts or oxides, it becomes highly explosive when confined. It will cause a violent explosion of any quantities of the acid when detonated by contact of picric acid and any metallic salt or oxide. It can be detonated by gun-cotton or any other high explosive.

Cordite is used as the explosive charge in cartridges, producing a violent explosion. For demolitions it is uncertain, and requires to be in close contact with primers to insure combustion. Like picric acid, it can be burned when unconfined, but when confined and detonated is of about the same strength as gun-cotton.

Fulminates are used to detonate charges, but are too

powerful to use alone for demolition. They explode with the slightest friction, and are extremely dangerous to handle. If thoroughly wet, they are inexplusive. They need careful packing in sawdust to render them safe in handling. At all times they must be handled with the greatest care.

Gunpowder is bulky to carry, and requires time in order to tamp it. It must be thoroughly tamped in order to produce the result, and when mixed with gun-cotton or other high explosive will scatter the fragments produced by the high explosion. It may be used in bags tightly tied, and exploded by means of a fuse.

The fuses used for military purposes consist of two classes—safety and instantaneous. The safety fuse is supplied in tins containing either 8, 24, or 50 fathoms. It consists of a cord of flax having a thin train of gunpowder down the centre. In order to protect it, it is coated with a covering of varnished gutta-percha. It is painted black, in order to distinguish it from the instantaneous fuses. It will burn at the rate of about 4 feet per minute, this figure being the margin of safety adopted.

Instantaneous fuses are painted orange in colour, and made of a strand of quick match surrounded by flax and layers of waterproof tape. A linen thread is cross-snaked on the outside, in order that it may be distinguished by touch at night. It is supplied in sealed tins containing 100 yards, and burns at the rate of 30 yards per second, or practically instantaneously.

The fuses are inserted into detonators or charges which are tightly inserted into the explosive, or are bound to them in such a way that the flash of the fuse will ignite the primer or detonator. A portion of safety fuse may be attached to the instantaneous fuse, the powder being exposed by cutting, and the two bound together, so that the passage of the spark

is uninterrupted. The safety fuse thus gives the firer time to get clear before the explosion.

Electrical detonators are also used, these being connected with batteries which are contained in a service exploder or connected with a switchboard. The wires are inserted into electric fuses or attached to electric detonators which are placed in the charge. The former is used for firing gunpowder, whilst the latter is used for firing gun-cotton and dynamite. Detonators are painted red in order that they be readily distinguished. The fuses are contained in an ebonite plug, which is inserted into the powder to be fired. The detonators contain fulminate of mercury, and are attached in the same way as the ordinary detonator.

As has already been explained, the stores required for Engineer purposes are forwarded from the depots on the lines of communication under the direction of the I.G.C., special transport being assigned when the quantity is too heavy or too bulky for the ordinary supply columns. Explosives pass through the Ammunition Parks and Columns, from which the supply is drawn.

It is not the intention to enter into the technical employment of the equipment used by the Engineers, nor to deal with the details of the different tasks which we have discussed, but the chain of responsibility and administration lies within the scope of the present subject, and those matters are the ones to which the present instruction is confined.

The responsibility has been explained, and may be summarized as follows: The Engineer Headquarters of a formation are responsible for advising the General Staff of the requirements from the point of view of the expert, and the best system of putting plans into effect. Subject to the instructions given, they issue technical instructions for the employment of the Engineer units in the formation, directing their efforts along one plan. In all routine requirements

the O.C. unit acts according to the local situation, and gives all the assistance required by the other arms whom he is detailed to support. In carrying out the work he is guided in his advice by the intention of the Commander as explained to him through his own Headquarters, directing the local efforts in such direction as will fit them into the general plan. The material and personnel may be bulked for employment on larger schemes where the situation renders this necessary, and all demands for material and labour are submitted to the Headquarters of the Engineers with the formation, in order that they may be filled to the best advantage.

CHAPTER XXV

MILITARY GOVERNMENT AND DISCIPLINE

Laws governing the Troops—Arrest and Trial of Offenders—Courts Martial—Provost-Marshals—Military Police—Control of Civilians—Precautionary Measures—Prisoners of War—Enemy Intercourse with our own Forces.

THE troops forming the field armies under the command of the Commander-in-Chief are governed by the military laws laid down in the Annual Army Act. In the application of the law, the Rules of Procedure included in the Military Manual of Law define the method of putting the laws into effect. Certain provisions for the control and discipline of the troops are more clearly defined in the King's Regulations. Certain powers to issue orders, which become law on promulgation, are given to the Army Council and the Commanders of forces, and these will be in strict accordance with the authority vested in the Officer making them.

In dealing with offences against military laws, rules, and regulations, power is given to Officers holding certain appointments to inflict punishments, whilst offences that are of a more serious nature are dealt with by military tribunals called Courts Martial. Of these there are several kinds, but in the field they invariably take the form of Field General Courts Martial. It is not proposed to discuss military law in general in this lecture, but only to deal with those portions which apply specially to the field, and the method of carrying out trials, punishments, etc.

In addition to the standing laws for the forces, there are certain Acts which are passed in case of emergency, under which extended powers are given to the Parliament and their authorized representatives, such as the Defence of the Realm Act and certain other Emergency Acts, which may or may not be invoked on the declaration of war. It is not proposed to deal with those applicable to Great Britain alone, but rather to take those which affect our forces when employed overseas.

Every Officer and soldier is liable to the provisions of the Army Act and all regulations based upon it, and he may be tried and punished for any offence against it. In awarding punishments, they may be made to affect the seniority, pay, service, possession of decorations, and liberty, subject to the limitations laid down for the various offences. An act committed on Active Service may be of much greater seriousness than a similar act committed under peace conditions, and for this reason the words "When on Active Service" added to the offence usually render the offender liable to more severe punishment. The conditions under which the troops take the field—that is, possessed of arms and ammunition—and the severity of the conditions of warfare make it essential that the laws which govern the soldier should be of a rigid type. Upon the discipline of the army and the spirit in which all orders are obeyed so much depends that, whilst it is not desirable that the troops shall be controlled by fear, it is essentially important that they feel the power which can be exercised in the event of necessity.

The trial of offenders in the field must be conducted with the utmost fairness, and the laws are so formed that the investigation of the offence will give the soldier ample opportunity to prepare his defence and secure a full hearing. The same spirit pervades the Army Act as is found in Civil Law—namely, that a man shall be deemed innocent until

found guilty—and the same responsibility attaches to the prosecutor, in that the charge must be proved before the accused may be put upon his defence. Certain charges demand that once certain facts have been established, the accused must prove his innocence, but the points to be proven by the prosecution are clearly defined. On Active Service a soldier may be placed under arrest for certain offences. Arrest may consist of “close arrest”—that is, confinement under a guard—or “open arrest,” whereby his movements are restricted. In speaking of a “soldier” in this lecture, it may be assumed that an Officer or other rank is referred to, except where the fact is specially mentioned that it refers to one or the other only.

The law demands that the soldier shall have his case investigated at the first possible moment, and directs that he shall not be kept in arrest longer than is absolutely necessary without his case being investigated.

In the case of an Officer, his case will be investigated by his Commanding Officer, who has no power to inflict a punishment on an Officer, but who may dismiss the case if he considers that the evidence is insufficient to warrant further action, or the case is not established. In the case of Warrant Officers and N.C.O.'s, of the rank of Corporal or above, they may appear before their Company or Squadron Commander, who has power to dismiss the case, but who cannot try the case, but must send it before the Commanding Officer of the unit.

Whenever a soldier is placed under arrest by any person, a charge-sheet must be submitted within a period of twenty-four hours; but if same is not produced within forty-eight hours, the soldier must be released. The charge-sheet must show that an offence against the Army Act or some authority based on that Act has been committed.

Offenders, other than Officers, are brought before the

Officer Commanding the Company or Squadron, who will investigate the case. He has power to inflict minor punishments, to order forfeitures of pay, which are automatically forfeited upon conviction, and also to award fines for drunkenness. The Company Commander must investigate the case, and will decide whether it shall be sent on to the Commanding Officer or not. He may dismiss it if not satisfied by the evidence produced, or he may refer it to superior authority, or inflict one of the punishments within his power of award. Such punishments as he may award are entered on a minor offence report, A.F. B.281, and he will sign same, the award being entered on the field conduct sheet, A.F. B.122, of the soldier. As has already been described, punishments affecting his pay will be recorded in his paybook, the amount being deducted.

Cases reserved for the Commanding Officer are paraded before him at a fixed hour, the Company Commander attending with the field conduct sheet, in order that the character of the soldier may be taken into account when awarding a punishment; this sheet must not be produced before the soldier has been convicted. The evidence is produced, and the witnesses examined in the presence of the accused, who may cross-examine witnesses and produce evidence in defence. The Commanding Officer may then dismiss the case, remand it for evidence to be taken in writing, or order the case to be remanded for a F.G.C.M. He may, if he decides, deal with it himself, his powers being restricted in accordance with the rank of the soldier, the maximum powers conferred upon him being limited to the cases of a private soldier. This is necessary, as offences committed by W.O.'s and N.C.O.'s must be considered as more serious than those committed by the ranks. If he gives a summary award—that is, an award that affects the pay or service of the soldier—he must give the soldier the right to elect to

go before a Court Martial for trial. If the soldier so elects, he must be remanded and application made for the F.G.C.M. Where the Commanding Officer decides to award a minor punishment only—that is, a punishment not affecting pay or service—he may refuse the right to be tried by a Court Martial. The power of a Commanding Officer is clearly defined in the Manual of Military Law, and will not be discussed in this lecture, which is confined to the administration of law.

A Field General Court Martial is convened by certain authorities in the field, and will consist of three or more members. Whilst Active Service conditions make it imperative that trials should be conducted without delay, owing to the loss of field service entailed by detaining men in custody, the law makes it very plain that the interests of the accused must not be jeopardized by any haste in trial. The accused is entitled to the same privileges as would be given him in any civil court. A Field General Court Martial has power to inflict the sentence of death, or any lesser sentence, subject to certain limitations in regard to the supreme penalty. If the maximum sentence is ordered, the sentence must be submitted to the Commander-in-Chief of the force for sanction. Under very urgent circumstances the sentence may be carried out at once, but such action must be fully justified by the conditions to warrant it. In no case would this occur except by direction of the Officer commanding a detached force.

In the field a soldier may be sentenced to penal servitude, imprisonment, or field punishment. The latter punishment is carried out with the unit, the offender being employed on all fatigues, and carrying his rifle and pack with the unit. When troops are halted, he may be directed to report to the Provost-Marshal, where he will undergo punishment. Field Punishment No. 1 entails being secured to a fixed object for

certain periods of a limited number of days. Imprisonment and penal servitude are carried out in the military prisons established on the lines of communication or outside the theatre of operations. Sentences awarded in the field may be suspended by order of a General Officer, when the soldier is retained with his unit, performing full duty, and given an opportunity of obtaining a remittance of sentence.

A soldier committed to a military prison is kept employed on hard labour under the direction of the prison authorities. Under certain circumstances a soldier may be confined in a civil prison, when he would be termed "a military convict." Orders of commitment, properly signed, must be submitted for every prisoner.

In order to see that sentences are legal and that the accused is fairly tried, a Deputy Judge-Advocate-General is appointed, whose office is situated at the base. All papers in connection with Courts Martial are submitted to him through the D.A.G. Base, when he will review them, and advise the Commander-in-Chief in regard to any illegalities or any apparent unfairness. This official provides a protection against unfair treatment for all ranks.

For the enforcement of discipline within a unit every Officer and N.C.O. is held responsible, whilst the discipline of formations is directly under the control of the Commander. In regard to the enforcement of discipline, the promulgation of any orders and regulations on the subject, and the appointment of the Courts Martial, the "A" branch of the Staff is responsible, and to assist them in the work they have a Provost-Marshal on the General Headquarters, with Assistant Provost-Marshals on the subordinate commands. Regimental units provide their own Regimental Police for the care of offenders, etc., within the unit. The Military Police of a formation are attached to Headquarters under the P.M. or A.P.M. and provide him with the medium for

establishing control. It is the duty of the P.M. and his subordinates to keep record of the proceedings of all Courts Martial within their commands; also a register of the punishments inflicted by them or their assistants, and the disposal of prisoners on completion of sentence. They are responsible for the usual police regulations regarding the military encampments, etc., and will use every effort to prevent persons wandering in the lines, unless in possession of a pass. They will endeavour to stop plundering, marauding, and other offences by the troops, and will collect all stragglers when troops are on the march or in action, returning them to their units with a report of the circumstances under which they were arrested. They take all precautions regarding the locating of spies, concealed communications, etc., and generally assist in the enforcement of all military laws. In their duties they may call for assistance upon any unit, which must be granted.

In the charge of prisoners, they are vested with the powers of Governors of Military Prisons, under the Army Act of 1907. Prisoners handed to them for punishment should be accompanied by a statement showing the offence with which they were charged, the date, and award, and by whom given.

Where they exercise their power to arrest, a charge-sheet is furnished by them, accompanied by a short statement of the facts, supported by such corroborative evidence as may be available. Should the accused deny the statements before the Officer Commanding, he must be given an opportunity of cross-examining the police witnesses personally.

In regard to civilians, the police are responsible that all complaints against troops are investigated, and will use every effort to arrest the offenders.

Passes may be issued, subject to local orders, by the A.P.M. for the use of civilians, a register being kept of all

passes issued in a book kept for the purpose. Any offence committed by the holder of such pass will be recorded on the back of the pass. As far as is possible, the civil administration will be used in regard to the civil population, the Military Police co-operating with them. Special instructions will be issued in regard to control of the movements of the inhabitants, sale of liquor, use of lights and fires, etc., and it is the duty of the police to see that the rules are observed.

The laws governing the civil population are made under what has been termed "Martial Law." There is no foundation in written law for the use of the term, which really means the substitution of military law for the laws of the country. Martial Law is established by proclamations circulated throughout the area in which it is imposed, and defining the extent to which it is applied, and any laws which it supersedes. The application of Martial Law may be confined to any district, or part of a district, or it may be made general throughout a country. The extent to which Martial Law will be applied will be governed by the conditions which render it necessary. The laws which may be imposed by an invading force are defined in the several International Conventions to which the Great Powers have agreed, and which are defined in the St. Petersburg, the two Hague, and the Geneva Declarations and Conventions.

The population of a country is divided into two classes—namely, the armed forces and the peaceful population. In preparing the rules governing war in civilized countries, the first named are represented by the combatant and non-combatant members of the military forces of a country. These forces may be composed of a regular army, militia, volunteers, and irregulars, but wherever they may have been enlisted, they must conform to certain rules to obtain the recognition which is accorded to the military forces of a country. They must be commanded by a person who is

responsible for his subordinates, have a definite mark by which they may be recognized at a distance, carry arms openly, and observe the rules of war. Inhabitants who organize to repel an invader, and who carry out the last two conditions, may be recognized, provided their country was not actually under occupation when they assembled and armed. The principle recognized by International Law is that the first duty of every citizen is to protect his country. Where the inhabitants have risen to defend their land under these circumstances, it is spoken of as a "levée en masse."

The rules of war laid down for the guidance of combatants govern the weapons with which war may be waged. Certain weapons are forbidden, such as the use of explosive, inflammable, or fulminating projectiles below the weight of 400 grammes (approximately 14 ounces), bullets having an expansive effect, asphyxiating or deleterious gases, or any method whereby the sufferings of a wounded person may be increased. Acts of treachery, refusal of quarter, assassination of prisoners, or outlawry, are forbidden. Prisoners of war are entitled to be treated in accordance with the laws of the nations. Certain civilians are liable to capture, those being the Sovereign or Head of a State and male members of his family, and the Ministry which directs the affairs of State, civil and diplomatic agents attached to an army, persons who have taken an active part in the war, and the mass of a population which has risen to protect the State. Medical personnel and Chaplains attached to military forces are not liable to capture.

Prisoners of war may be interrogated and must give their names and ranks, but may refuse to answer any other question. Any humane method may be adopted to extract information from them, but force may not be used. A prisoner is entitled to retain in his possession his personal property, except articles with which he may do harm to

others, or which may facilitate escape, such articles being taken on receipt until cessation of hostilities.

A prisoner may be compelled to carry his belongings, and no claim for assistance from the captors may be enforced. Prisoners may be subjected to disciplinary action, and for any offence may be tried and punished as provided by the laws which govern the capturing army. Prisoners are not to be regarded as criminals, nor may they be treated as such, unless their actions after capture justify the treatment. The scale of rations and quarters allowed for prisoners should be the same as that allowed for the army capturing them, upon which they are a charge for maintenance. Officer prisoners are entitled to the pay of their corresponding rank in the army of their captors. Prisoners may be employed on labour of various kinds, pay being given them for their work, but such labour must not have any connection with the war.

Prisoners captured by British forces are reported to the Headquarters of the formation as soon as possible, and are passed to the Intelligence Department for interrogation. They may be searched, but a receipt must be given for all belongings, an inventory of the possessions being placed with the bundle. The prisoners should be formed into batches, and warned that any attempt to escape will be suppressed with fire, if necessary. They should be kept concentrated whilst on the march, and usually an Officer will be detailed to deliver them to the Headquarters. The "A" branch is responsible for the provision of escorts, and as soon as the Intelligence Department have completed their examination of the prisoners, they will send them to the place of internment for safe custody, their belongings being forwarded with the inventory. A record of prisoners is kept on A.F. 103a, the return being forwarded to the D.A.G. Base, a duplicate copy being retained with the formation.

Enemy dead will be searched, their possessions recorded, and A.F. 103b made out under the instructions of the "A" branch. The name, number, unit, etc., of the dead will be copied from the identity disc, and attached to the bundle containing the belongings. If no identity disc is found, any particulars found on the person of the body, such as number of clothing, arms, accoutrements, or badges of the unit, will be recorded. The place of burial will be noted and forwarded with the belongings.

Enemy wounded are taken charge of by the medical personnel, any papers of importance being taken from them and forwarded with a nominal roll to the General Staff, whilst the patients will be reported on the ordinary medical returns and on A.F. 103a to the D.A.G. Base, the necessary escorts and directions for internment on recovery being transmitted by the "A" branch at the place where they are finally discharged from hospital. Officers detailed to take charge of burial-parties will report to this branch, and hand over all belongings of the enemy dead.

Every Commandant of an internment camp or any medical establishment wherein enemy prisoners are confined will keep a register of the prisoners on the command, and also of all belongings which accompanied the prisoner. A number will be given to each prisoner, and will be used in all particulars relating to him. This number will not be changed when once allotted. Any subsequent changes of location regarding a prisoner will be entered on A.F. 103a and notified to D.A.G. Base. The names of the enemy prisoners and enemy dead will be forwarded through the Prisoners of War Committee established by a neutral, and notified to the Government of the opposing country, similar returns being made to us.

A British Officer or soldier is forbidden to give a parole, but is in duty bound compelled to avail himself of any

opportunity to escape and return to his own country. When any Officer is taken prisoner and eventually returns to his unit, a Court of Inquiry will be convened to investigate the circumstances under which he was captured. They will make a finding, and if such finding reflects upon the character of the Officer, he must be furnished with a copy of the finding.

In regard to the civil population, every step must be taken to protect them from the effects of fire; but where a place is defended it is permissible to bombard the place, without regard to the civil population. Any area may be placed outside the bounds for the civil populace, and such steps as may be necessary may be adopted to prevent the ingress or egress of information. Hostages may be taken for the good behaviour of a populace, and fines or other punishments may be inflicted for any act of treachery against our arms.

Any person committing a hostile act against our forces, and who is not uniformed or otherwise distinguished by a mark as required by the forces, renders himself liable to the punishment of death. A spy is defined as a person who clandestinely seeks to gain information, not being in the uniform of the opposing forces, whereby he may be recognized. A person found wearing the uniform of our own forces, without the proper authority, may be condemned as a spy, unless he can show that he had no intention of obtaining information regarding our forces. A soldier who succeeds in getting through our lines, but who is wearing the recognized uniform of his own forces, cannot be treated as a spy. A spy, even though caught in the act of spying, cannot be condemned without trial. If a spy succeeds in rejoining his own forces, he is absolved of any responsibility for his acts, and if he is again captured whilst fighting as a soldier, he cannot be treated other than as a prisoner of war.

In the conveyance of communications between the enemy forces and our own, the authority of the Commander must be obtained. Should a flag of truce be displayed by the enemy, the party, which usually consists of a flag-bearer, trumpeter, or bugler, interpreter, and a parlementaire, must be halted outside our lines, until the authority of the Commander for entrance has been obtained. Usually a Staff Officer will be sent down to conduct them through the lines, the party being blindfolded first, the interpreter and parlementaire only being taken to Headquarters, the remainder being left under guard. In any cases of doubt, a Commander is justified in refusing to recognize a flag of truce, and may decline to accept communication. Any act of treachery may be promptly suppressed by fire, even though the flag is still displayed.

The subject of International Law as it affects the operations of the forces in the field is too extended to be taken up in the compass of these lectures, but the whole of the contents may be found in the Manual of Military Law, which should be studied by every Officer.

The brief summary of Military Law given in this lecture is by no means complete, nor is it to be accepted as being sufficient for the operation of any unit in that regard, but it is sufficient to show the channel of responsibility in regard to the enforcement of discipline and the punishment of offenders, all that concerns the lecture on the subject of Military Administration.

CHAPTER XXVI

RECAPITULATION

Relation of Mobile System to Siege or "Trench" Warfare—Comparison of Administrative System under Mobile and "Trench" Conditions—Review of Previous Lectures—Co-ordination of all Services by Staff—Interdependence of Field Forces and the Lines of Communication—Facts for Future Study—Value of Knowledge of General Working of the Whole Army.

IN all of our previous lectures we have discussed the chain of administration from the point of view of mobile warfare, except that in our studies of the formations and units we spoke of the method by which the various arms "piled up" upon the army being brought to a standstill by opposition. We shall now briefly consider the present sedentary, or "trench," warfare. The process of development of the present line, as a part of the strategic plans of our Commanders, found our forces resisting the enemy advance, and by a swift stroke passing from a defensive to an offensive force. Fortune favoured our armies, and the enemy commenced his retirement upon the position upon which he proposed to make his defence. Our troops, finding these positions too strong for further advance, immediately commenced to dig themselves in. As soon as the forward troops were halted, the remaining forces in rear commenced to reinforce them. The heavier Artillery from the Corps Troops and the still heavier equipment of the Army Troops were moved forward to the support of the halted firing-line. Gradually these forces were distributed in position behind

the firing-line, and as time gave the opportunity to each side, the positions were strengthened. Our aim was to gain time for reinforcements to arrive from England, whilst the Germans, evidently temporarily paralyzed from the tremendous losses which our vigorous defence, and later offensive action, had produced, were compelled to gain time for reorganization. Their failure to press forward is one of the mysteries of the campaign, yet to be explained. That they had adequate reserves is evident, but that they had outstripped their administrative chain appears to be equally certain; but a short time should have enabled them to consolidate their forces, and again pass to an offensive that should have been decisive. They hesitated, however, and our defences were strengthened, until later the enemy attempts to smash through met with no success. By that time we had made up for shortage in numbers by strength of defences, coupled with effective musketry practice.

The development of the entrenched line, therefore, was simply the natural condition upon which all history has taught us to anticipate the battle for fire supremacy, and recent campaigns have shown us that the length of the fire battle increases with the improvement of modern armament. Naturally, the time spent in the entrenched area is turned to advantage by both sides. Improved engineering equipment is brought up to the line; all troops concentrate efforts towards the strengthening of their positions, and by stages the extensive field fortifications are brought into being. This is not a new situation; it is as old as history; and instead of moving forward, we might almost be said to have moved backward, with the introduction of the catapult, armour, grenade, etc. Both sides began to devote attention to mechanical appliances whereby they might reduce their adversary's strength, and as a consequence certain appliances were brought into the line, their uses, however,

being restricted to positions within close reach of each other. The Corps and Army Troops were thrown into the line, temporarily attached to the fighting formations in advance, and such minor modifications in their organization and equipment made as the local circumstances required. It is in this way that we find the mining operations, use of asphyxiating gases, grenade, trench mortars, etc., being introduced. Underlying all of these preparations, however, we find one main objective on both sides—namely, to advance and dislodge the opponents from their position. Every effort is concentrated towards that one end. A war of attrition has ever been considered as an impossibility as far as obtaining decisive success. To arrive at a decision it is necessary to again bring about a war of manœuvre, wherein the one force is outmanœuvred, severely handled, disorganized, and by constant and unremitting pressure denied any opportunity to reorganize. This is what both sides are striving for.

Let us suppose that we are fortunate enough to obtain the complete mastery of the enemy lines—a matter of which I have no personal doubt as to our eventual success—and we force the enemy to retire. We shall press forward after him, but with what? The answer must be, with forces who are able to relentlessly follow the enemy day after day, denying him rest or opportunity to re-equip or reorganize. In other words, a mobile force. Mobility means the use of equipment which can be moved at the normal rate of marching—*i.e.*, $2\frac{1}{2}$ miles per hour—as opposed to an enemy who must accept battle to impede our advance, or retire at a similar gait. Broadly, this means that both sides resume the normal methods of war, exactly as at the commencement of the war. Naturally, the enemy will prepare alternate lines of retirement, with strong posts to delay our advance; but if, as is the case with our forces, each day

brings an increase in strength, whilst the enemy has a consequent loss on his retirement, being further hampered by loss of morale and insecure communications, due to the fact that he is retiring through invaded territory, there is every reason to hope and suppose that we may be able to concentrate a sufficient driving force to be able to sweep his defences and force him back upon positions which offer him the necessary natural strength to make up for his shortage of numbers. The strategic or tactical questions of the campaign have no place in these lectures, but to appreciate the purpose of our organization and the transition from the sedentary to the mobile warfare, as viewed from the administrative point of view, we must consider briefly these phases. No finer study could be found for the soldier who has a true perspective of strategy and tactics than the possibilities which the terrain between German soil and our present line shows.

We must return to our administrative work at this point, and consider the organization as expressed in previous lectures. We have clearly described the principles of organization, and we know that without mobility our forces will be valueless in the advance. We must provide for a lot of new weapons which are allied to our fighting unit, the grenade, the trench mortar, etc., for which it is necessary to provide transport, and we naturally ask how the two can be met consistently. In the first place, as soon as our transport accompanying the field unit has deposited its load with its own firing-line it is withdrawn to a place of safety, its subsequent journeys being governed by the cover available, which may be merely the cloak of darkness. As the transport is emptied and withdrawn, it will be refilled by the units in rear, those units being halted at safe distances in accordance with the orders of the Commander of the force. If the stationary positions are prolonged, as in the present case,

all units in the forward positions will assemble their immediate requirements in "dumps" situated close to the firing-line, the transport being withdrawn to the rear and parked in safety. As the range of the modern weapon enables the enemy to make accurate shooting up to about 5,000 yards behind the line (even greater distances are possible, but the errors of the gun, etc., make the effect negligible), all transport as far back as the Divisional Headquarters will have to be eliminated as far as daylight movement is concerned, and a series of "emergency dumps" established instead; and since the movement of transport can only be made within the few hours of darkness, these dumps will be built up to meet emergencies of such time as the local Commander, subject to orders he receives, may direct. This is what has happened, therefore: a series of Divisional, Brigade, and Regimental reserves of supplies are deposited at suitable places within reach of the units, from which immediate requirements are drawn. The whole transport of the units is available for use by night, and as the line is more or less permanent, the railhead will be pushed forward, thereby reducing the distance between the rail and refilling points; and as the several échelons of transport may be eliminated by that means, the extra transport needed for special supplies is provided from these temporarily depleted mobile reserves.

In these few brief words we get the pith of the whole administrative situation at the front to-day. The mobile reserves of all requirements have been deposited by night in suitable positions, and the whole of the transport is then available to bring up the requirements needed to replenish the reserves or to build them up, as the case may be. These "dumps" represent the various columns and parks in our chains, with the one difference that they are not actually ready to move, but on being loaded into transport they would move in rear of the forces, should they advance.

The distribution of troops is along similar lines. If the divisions in the firing-line advance, the Corps and Army Troops having charge of the extra equipment become responsible for the collection of their own equipment, and would concentrate at a given point under the direction of their own Corps or Headquarters Staff. For administrative purposes they are attached to the divisions to which they have been allotted, and the necessary extra supply vehicles taken away from their own supply columns and attached to the supply trains serving the formation to which they are "attached."

In the matter of records, reports, etc., the same elasticity is found. Intercommunication has been established along the permanent cable or other lines; and as Headquarters are constantly in touch with their units, they are able to call for periodical reports, returns, etc., entering them on their own routine reports and again passing them on to the formations to which they belong.

Now, it will be seen from this apparent careless description of the "trench routine" that the principles of mobile warfare are being observed; and lightly as this subject has been spoken of here, it is an established fact that the soldier who is thoroughly grounded in the general principles of warfare as laid down in the official textbooks will find himself in a position to readily undertake almost any duties in the firing-line. It is simply the application of the principles in accordance with the local circumstances, and any man of ordinary intelligence will be able to perform his duties satisfactorily if armed with this knowledge. It is not contended that study will not be necessary, or that the lessons gained in any part of the entrenched line can convey no information to the student of mobile warfare; on the contrary, he will more readily appreciate the value of those lessons if he has previously studied the general art of war

and understands the principles taught. Special subjects, such as the use of gas, employment of grenades, trench mortars, and other trench weapons, require technical training in the very efficient schools which have been established behind the line, but, above all, it must be appreciated that the aim of the forces is to get forward; but even that aim can be seriously jeopardized if the Officer in charge of the local offensive is not thoroughly versed in the importance of communications, supply, and evacuation of unnecessary impedimenta, apart from the general tactical questions.

It may be as well to review the previous lectures which we have given, in order to connect them up with each other. They must not be looked upon as being a series of separate links in a chain, but rather as one complex wire rope, in which each strand bears an equal tension, the whole being interwoven into one complete fabric.

We will take the lines of communication first. These are more or less permanent, and will be constantly moving forward behind an advancing army. Local facilities are utilized to the best advantage; and as the force advances with each bound, the railway is pushed forward, bases advanced, and the material requirements of the force brought within touch of the field forces. The aim of the lines of communication must be to bring within reasonable distance of the troops in the field all that they require, the distance being regulated by the tactical safety of the lines. The Commander-in-Chief will inform the authorities on the lines of communication as to the extent of their advance, and instruct them as to the bounds of their responsibility. The defence of the lines of communication has been fully described, so that we need not consider a matter which is simple; but the administration is a more complicated matter, and requires further illustration to make it clear.

The I.G.C. and his Staff, to which are attached the repre-

representatives of the services of maintenance, is responsible for the provision, concentration, distribution, and forwarding of all materials required for the forces in the field, and for the removal of surplus equipment, etc. It would be impossible for one man to personally supervise all the matters which come under his notice, but he must rely upon the wisdom and efficiency of his subordinates. The Commander-in-Chief will inform the I.G.C. as to possible requirements, while he in turn will issue instructions to the service concerned. To make the operation clear, it may be as well to take one item alone and follow the various steps through in detail.

Let us suppose that the Commander-in-Chief has decided to take steps to commence a strong offensive in one part of the line. He will not advertise his plans to all and sundry, but would probably inform the I.G.C. that he proposes to commence an offensive between certain dates, and that for the purpose he proposes to use a large number of heavy guns. He may indicate the quantity of ammunition required, and, taking the modern offensive, we will suppose that he issues an order somewhat after this style: "I shall require a total of not less than 300,000 shells *per diem* for a period of one month concentrated in the area bounded by —— and ——."

The I.G.C. will first notify the Q.M.G. at the War Office of the prospective requirements, who will issue orders in turn to the munition factories concerned.

The I.G.C. will then notify the D.O.S. that he must be prepared to receive and tranship that number of shells per day, and will instruct him as to the points at which they are to be concentrated, which may be at several advanced bases. He will instruct the Base Commandant that heavy shipments of shells are to be received, and that they must be given precedence over the lines to the bases in advance. The Railway Service is instructed to prepare the necessary

tonnage to carry them, and will prepare a time-table of movement of trains, availing themselves of returning tonnage for the subsequent consignments. These instructions are communicated to the local representatives at the various bases, who in turn make arrangements for sidings for loading and unloading. The necessary Ammunition Parks are concentrated at the railheads affected, and their routes prepared. Extra transport required is obtained from the D.T. Eventually the shipments will be assembled at the Home ports, when their movement will be arranged by wire with the I.G.C. The D.S.T. will arrange for the vessels, and the M.L.O. at the base, acting on the instructions received from the Base Commandant, will arrange for the unloading and for the docking of the vessels, giving them precedence according to instructions. The shipments will be unloaded by the Base Ordnance Companies, any additional assistance being arranged through the Base Commandant, and probably the trains would be loaded direct from the steamers, in accordance with arrangements made by the Base Commandant with the Railway Transport Service representative. The trains are then sent forward to the various advanced bases, where they are broken up and redistributed to the several railheads served by that base. The trains may be unloaded or simply redistributed according to the requirements, but in each case the Ordnance Depot at the Advanced Base is responsible for the provision of labour and direction, the trains being later operated to railhead by the railway authorities.

We must now turn to the field force for a moment, and see what is taking place there. The G.H.Q. have been advised of the plans of the Commander-in-Chief, and consequently each branch starts to prepare their orders in connection with the scheme. The "G" branch will prepare the actual operation orders, and will obtain from the "A"

branch any matters regarding the evacuation of wounded, custody of prisoners, discipline, etc., which must be embodied in the operation orders. The "Q" branch will inform the "G" branch as to arrangements for provision of ammunition, supplies, water, transport, etc., coupled with directions as to traffic control, as prepared by the "A" and "Q" branches in consultation. Probably arrangements for the evacuation of sick and wounded by means of returning transport may have been considered by these two branches, and arrangements made accordingly. The operation orders will only contain such information as it is necessary for the troops as a whole to know, but meanwhile special instructions for the various Administrative Services will be prepared. Each Administrative Branch will then issue its own orders regarding the operations of its particular service.

The material point with which we are now concerned is the method by which the necessary connection is made between the lines of communication and the field transport. The position of the rendezvous may be made by the G.H.Q., or that duty will be given to the armies and corps according to the situation. Usually one railhead will be serving an army, so that it would be to that unit the power would be given. The Army Headquarters would notify the areas in which the rendezvous for the different corps will be situated, and will issue instructions as to the quantity of ammunition needed in those areas. The Corps Headquarters would be instructed to arrange for the reception of their supplies at those points, and for their redistribution to the advanced forces. The Corps Headquarters would then make arrangements with the divisions in advance for the reception and distribution of the supplies at Divisional Rendezvous. Now the supplies which we have assembled at railhead are moved forward by means of the Ammunition Parks, moving direct to the Corps Rendezvous, where the representative of the

“Q” branch would meet them, and then redirect them forward to the Divisional Rendezvous, where they are again met and redistributed to refilling points. In this way the communication between the field forces and the lines of communication is maintained. We have used one illustration, but it must not be supposed that it will be in regard to one article only that these arrangements must be made, similar rendezvous being required for each of the different services, and it is in this regard that the supervision of the Staff becomes necessary; since they issue all orders for the various services, they must see that there is no congestion of traffic over a few roads, but that all roads are utilized to the best advantage. In this way the supply columns may be directed over second-class roads to their rendezvous, etc., reserving the good roads for the more urgent transport.

If the army is advancing, the position of these rendezvous will be changed daily, and consequently it will be necessary to send information as to locations with each change in the positions of the force; and where the force moves to a flank, it will be necessary to utilize different roads for each day. The whole question of the exact working of the Administrative Services must be looked upon as an elastic one, capable of being adapted to any situation, and not necessarily a hard-and-fast routine, but if the operation of the Staff in the field as illustrated, and the method of establishing communication with the lines of communication is properly learned, then it will readily be understood that each situation is daily reviewed, and the disposition made accordingly.

The great difficulty for the amateur soldier is to get a true perspective of the whole question of administration, and in order to try and give this, we shall take a few figures based upon a supposed strength for the forces in the field. Needless to say, these figures are not correct as far as strength is

concerned, nor is it politic to offer any information as to possible distribution.

Let us suppose that the forces in the field represented a total of 6 armies, representing a force of 2,000,000 men and 65,000 animals. The supplies needed to feed this force make a total dead weight of 10,000 tons per day, requiring a transport service of 5,000 3-ton lorries and 6,000 G.S. wagons in the Supply Service, with the addition of the regimental wagons to draw from the Supply Service. The ammunition required on present conditions is about 25,000 tons per day, which again requires the addition of 10,000 lorries and 120,000 wagons to distribute the supply amongst the units. We have, therefore, considering two staple requirements only, a total dead weight of 35,000 tons per day, requiring the direction, control, and distribution of 15,000 lorries and 126,000 wagons. This is exclusive of extra reliefs and wagons to replace losses, and without considering the hundreds of other articles required by our forces. Even these figures can have little value unless it be remembered that the dead weight referred to is received at two or three ports, must be shipped by rail, distributed at bases, transhipped by rail in smaller quantities, and again moved over available roads to the unit for which it is destined, and eventually be handed to the soldier in the form of a ration; or as munitions, *once in every twenty-four hours*.

It must be admitted that any organization that can stand the strain of warfare, accomplish a feat such as that just described, and at the end be able to justly say that we have never failed to accomplish that feat in any twenty-four hours since war was declared, is worthy of closer study than that given by the average soldier.

The question is frequently asked whether it is necessary for a soldier to learn all that has been told to you to become an efficient Officer. Candidly, one is compelled to reply

“No,” but one can equally say that he will never achieve any great success as a soldier unless he does understand all of these matters. An army without food, ammunition, or water, is as helpless as a baby, and as its success depends to such a vital extent upon its ability to maintain itself, every operation in war will consist of about 75 per cent. administrative detail and 25 per cent. tactics; and the more technical and scientific warfare becomes, the more important must communications and all that they imply become.

It is not contended that a soldier must know all of these details, but it will be evident that the more he understands the relation of other arms and services to himself, the more easily will he be able to determine his action under almost any circumstances, since he will be able to gauge the effects of his local action upon other units whom he cannot see, but whose operations are as vital to his own welfare as if they formed an integral part of his unit. The effect of enemy fire may frequently interrupt the normal chain of supply, and the man who has no idea of its organization will have little chance of picking up the loose end, if he does not know where to look for it. No man can operate the war entirely upon his own strength or capabilities; and as he must be dependent upon others to assist him in his efforts, it naturally follows that the more he understands them, the better he will be able to avail himself of their help, and the more easily can he advise and direct them.

In concluding these lectures, it is to be hoped that the material points may not have been swamped by details, and, as far as is consistent with the practical requirements of lectures on this subject, the details have been confined to points necessary to show clearly the principles which are taught.

The study of general principles of warfare presents more actual value to the real soldier than any memorized study of

figures or diagrams, since no two operations in war were ever exactly alike, and the only safe knowledge is that which lends itself to ready application to the circumstances as they exist. The game of war is a great game of chance, and since you have less control over your opponent than in any other game, it is the unexpected that must be prepared for; for the rules which govern the game are very elastic, and can be interpreted to the advantage of the man on top at the finish.





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